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A REALISTIC UNIVERSE

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A REALISTIC UNIVERSE

AN INTRODUCTION TO METAPHYSICS

BY

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To

MY FRIEND AND TEACHER

JOSIAH ROYCE

PREFACE

This volume on metaphysics is the sequel of a volume on the theory of knowledge, entitled "Truth and Reality," which was published in 1911. The two volumes furnish a survey of the field of general philosophy from the point of view of pragmatic realism. This attitude which the author has been championing for several years is an attempt to apply scientific method to philosophic problems. The term pragmatic is used in the sense which was first advocated by C. S. Peirce, and which is defined by the author in his own terms in "Truth and Reality." As applied to metaphysics the pragmatic method means that we must judge the nature of reality, in its various grades and complexities, by the consequences to the realization of human purposes, instead of by *a priori* assumptions. Some may prefer the older adjectives of "empirical" or "critical"; but these terms seem definitely associated with certain historical doctrines, and a new term seems to be preferable in designating the scientific tendency of to-day. There is need in every age of retranslating the perennial problems of philosophy into terms of living human interest; and the author hopes in a measure to further this movement at the present time through these volumes. In "A Realistic Universe" the author has tried to make vital the fundamental problems of metaphysics in terms of our present thought-world, without the cant of the past, but with a deep sense of indebtedness to the masters of all time. While the book is intended primarily for the philosophic student, the aim has been to make the style as clear and simple as the problems would permit. In the use of scientific material, an effort has been made to find sources which would be intelligible to the layman rather than to make an appearance of erudition. Some portions, such as the introductory chapter and part five on Form, may be of special interest to the general reader.

The work as it now stands, imperfect as it may be in execution, has had a long history. The oldest portion is that relating to time. The author's theory of time was first outlined in a paper on that subject, written for Professor Royce's Seminary in 1897–1898. It found fuller statement in his doctor's thesis on "The Concept of Time" in 1899; and was further expounded in a monograph entitled "Time and Reality," published in the *Psychological Review* monograph series, No. 26, in 1904. A brief statement in the *Journal of Philosophy, Psychology and Scientific Methods* in 1905 has been partly made use of in this book. As there has been no material change in the author's attitude since the publication of the monograph, the reader may be referred to this for supplementary treatment. Preliminary studies of the concepts of Space, 1906, Consciousness, 1908, and Energy, 1908, have been published in the *Journal of Philosophy*, etc. While the main view-point remains in each case, the material has been thoroughly restated and should be judged by its present form. The same applies to the article, "The Ought and Reality," which appeared in the *International Journal of Ethics*, 1907, and which in the present volume has been restated under the title "Form and the Ought." Other papers which have been made use of, in whole or in part, are: "Do Things Exist?" 1912, and "Individual and Social Minds," 1913, from the *Journal of Philosophy*, etc.; "Knowing Things" from the *Philosophical Review*, 1911; "Knowing Selves," *Psychological Review*, 1912; "The Identity of the Ideals" from the *International Journal of Ethics*, 1912; "A Rehabilitation of Teleology," under the title of "Teleological Idealism," from the *Harvard Theological Review*, 1912; "Pragmatic Realism — the Five Attributes," under the title of "The Five Attributes" from *Mind*, 1913; and "The Divine Fivefold Truth" from the *Monist*, 1911. The author wishes to express his appreciation to these journals for their coöperation and encouragement, which have meant a great deal to a man working in comparative isolation. The work, however, is in no sense a compilation of articles, but was early conceived as a systematic unity, though he wished the advantage of the objectivity and time perspective furnished by preliminary publication, as well as the incentive that comes from feeling a part of the social consciousness with the informal reactions thus made possible. In this connection, he wishes to express also his appreciation to the Western Philosophical Association, before which many of the preliminary studies were first read.

As regards his indebtedness to other workers in the field, the book itself will have to bear testimony. Among philosophers, his indebtedness is greatest to the standard masters, not only because of their intrinsic merit, but because they have been most accessible. In all things speculative, we must still sit at the feet of the Greek masters. His first systematic training in philosophy the author received under the tutelage of the great German idealists, Kant, Fichte, and Hegel, thanks to his first guide in philosophy, James Seth. From the British empiricists he has learned, he hopes, a homely regard for the facts of experience. Of French thinkers, he owes most to Poincaré, whose phenomenal grasp of science and transparent genius place him in a class by himself among philosophers of science. Of the author's immediate environment, he hopes there may appear in this work something of the inspiration of the great leader in American philosophy, William James, and of its recent laureate, Josiah Royce. Nor could one escape the vitalizing influence in our country of its great teacher, John Dewey, and the Chicago School. When the author was working out his theory of time, he did not have the good fortune to be acquainted with the brilliant work of Bergson on that concept. Not even William James seemed conscious of Bergson's contribution in the later '90's. While the author's theory agrees with that of Bergson in aiming to establish the reality of time, both the fundamental intuition and the method are different. The concept as set forth in this volume, and in previous discussions, must be regarded, therefore, as a different concept. In the later revision of the work, the author has been stimulated by the recent realistic discussions, both in Great Britain and America. Since the first draft of this work was completed in 1912, and most of it antedates the movement sometimes called "the new realism," perhaps more properly called analytical realism, its development has been comparatively independent of this movement, and has little in common with it either in spirit or method. As between the extreme anti-intellectualism of Bergsonism, and the extreme intellectualism of analytical realism, pragmatic realism steers a middle course. While maintaining, as against analytical realism, that reality is more than a congeries of abstract logical entities, it insists as against intuitionism on the relevancy of thought to reality. Only thus could thought furnish valid leadings in our practical and theoretical conduct. This attitude is in line with common sense and empirical science.

The present work does not aim to be a compendium of current literature. There are books which serve this purpose in an admirable way. It must be judged rather as a personal reaction to the permanent problems of human experience, for, whether we will it or no, our systems are after all personal reactions. If they are sincere and thorough, we may hope that they will further the total movement of truth. The time seems peculiarly auspicious for such an attempt at synthesis. While there has been much of suggestion and inspiration in recent discussion, the constructive efforts have been disappointing. This is due, no doubt, to the magnitude of the task. In the complexity of modern thought and life, we cannot perhaps hope for an Aristotle. What could once be accomplished by individual genius, must now be carried out piecemeal by the interstimulation and supplementation of a collective mind. The author will be satisfied if he can count as even an infinitesimal part in this infinite task. As this work has grown up for the most part on the western prairies, may it reflect the homely sanity of the great West.

Northfield, Minnesota
September 14, 1916

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INTRODUCTION

THE MEANING OF METAPHYSICS

The Place of Metaphysics. — In this age of narrow specialization and absorbing immediate interests, it is well that we should try to recover what Plato called "the love of the wholeness of things, both human and divine." By doing so, we shall gain greater insight into our special problems and greater sanity in practical life. For philosophy is merely sustained thinking about the things that are of vital and permanent concern to the human race in the whirl of circumstance in which we find ourselves.

There are many reasons for the disrepute into which the noblest of sciences has fallen in our own day. One of these is the bias of words. Metaphysics has been confused with obscurantism and occultism; and professional philosophers are in a large degree to blame for this. They have been victims of a traditional vocabulary which once was significant in the history of thought, but which has ceased to be relevant to our special matrix of problems. The tendency has been to substitute counters for things, antique phrases for clear and distinct ideas. Whenever philosophy has been vital, it has always followed close upon the heels of science and human interest. It was so that metaphysics originated as a science in the days of Aristotle. It is so that it has maintained itself ever since, whether translated into the theological atmosphere of the Middle Ages, or into the scientific spirit of the age of Descartes and Locke. To be vital to-day, metaphysics must clarify our own scientific and social problems.

Another reason is to be found in our narrow emphasis on the practical. The most dangerous sophist in any age, as Plato pointed out, is the public sophist, — the prevailing emphasis of the social mind. To-day, the emphasis is on immediate material results rather than on the calm contemplation of the meaning of things. We are bent on producing weather rather than on examining its whither. We seem to have raised weather enough; and if we persist there will be nothing much to contemplate but ruins. Bitter after-reflection may teach us that the question is not merely of efficiency; but to what end?

Not the least important reason is the slovenliness and laziness in our present day thinking, which, particularly in our country, is the outcome of our new education. This is rapidly making this generation incapable of sustained reflection. Religion has become a matter of sentimentalism instead of the systematic interpretation that characterized the Middle Ages and the Reformation. In philosophy we have substituted intuition for serious reflection; in science, narrow specialization for comprehensive perspectives. There is danger that we may prove unfit for the task of meeting the great social problems of the day, which will require the most stubborn sort of thought for their solution. In such an age, we need to hearken back to Plato's warning that things can only be set right when philosophers are kings; and philosophers are men who can think in terms of the whole. Indeed, the great masters, whether in the world of thought or of action, have always been philosophers, even if they have not always been conscious of the fact.

Though we may neglect metaphysics, we cannot get away from it. Being of the very nature of reflective thought, it can say: "When me you fly, I am the wings." Metaphysics, as Comenius pointed out, begins at the mother's knee. "Thus, from the moment he begins to speak, the child comes to know himself, and by his daily experience, certain general and abstract expressions; he comes to comprehend the meaning of the words *something*, *nothing*, *thus*, *otherwise*, *where*, *similar*, *different;* and what are generalizations and the categories expressed by these words but the rudiments of metaphysics?" We are thus introduced by social suggestion to the distinctions of things and qualities, mind and matter, cause and effect, space and time, the conscious and unconscious. We are taught to construct a scale of values and to believe in a world of ideals. Our common sense and science are shot through with metaphysical concepts. The difference between such metaphysics and that of the philosophic thinker lies in the degree of thoroughness with which we pursue such matters. It is clear then that metaphysics has a permanent claim on human nature. We may well agree with Aristotle: "All the sciences indeed are more necessary than this, but none is better."

It must be said, too, that in spite of the shallowness of our thinking, there is, in our age, a strong feeling for ideals, a sound faith in melioration which persists undismayed in the baffling complexity of our problems, and which furnishes the one ray of hope in a great international tragedy — a promise of better things. It is at heart an idealistic age — an age of reconstruction, of profound awakening to human claims. This should give philosophy a new opportunity in the building out of the meaning of life.

The Presuppositions of Metaphysics.—A few years ago it was fashionable to advertise a philosophy without presuppositions. This would indeed be radical empiricism; but it would be suicidal at the outset, since to philosophize we must think; and thought has its own presuppositions which are implied in all its procedure, whether metaphysical, or more narrowly scientific. Metaphysics, as a systematic treatment of experience, implies logic. It assumes that there are valid rules of thought, that we can arrive at common understandings.

But metaphysics, as a final evaluation of experience, implies more than the laws of thought. It implies a faith in their fitness or relevancy to our world. We must trust the instrument at the outset. The mute faith in the possibility of knowledge is the very spring of the process. This is fundamentally an attitude of the will. But it is a constructive attitude, and justifies itself in the progress of human experience. To criticize the instrument in the abstract is at best a futile task. Some philosophers have concluded, from certain *a priori* considerations, that thought is contradictory or inadequate. Kant finds it suspicious that thought is equipped with certain categories at the outset. These seem somehow arbitrary; they carry on their face no guaranty that they fit into the empirical structure of things. The British agnostics have noted the relational character of thought, and have assumed for some traditional or temperamental reason that reality is the unconditioned or non-relational. But the fruitfulness of such thinkers as Kant and Spencer lies, not in their *a priori* assumptions, but in the contribution which they have made to the correlation of the values of experience by means of the instrument which they mistrusted. Somehow, the laws of thought must be the laws of things if we are going to attempt a science of reality. Thought and things are part of one evolving matrix, and cannot ultimately conflict.

Hegel here shows himself a saner pragmatist. The categories of thought must be tested by their success in actual use. If the values of experience can be correlated and unified in terms of the categories of thought, then thought requires no other credentials. Its validity is guaranteed by the outcome, not by any *a priori* test, which is a mere hewing *in vacuo*. We may object to Hegel's own formulation of the fundamental concepts; we may not share his confidence in the abstractly logical character of the process thus to be manipulated. His triadic relations may appear arbitrary and stilted. His system may seem too much like the staging of abstract categories, and as lacking real movement and zest. But that, after all, is because he fails as measured in terms of his own criterion — the success of thought in realizing its concrete leading from part to part, from corridor to corridor within the complex structure of reality. The real world is more fluent and complex and baffling and tragic than Hegel's logic with all its interesting paradoxes could comprehend. His faith, however, is invincible and immortal. Let us give thought a fair field at the outset. Let us not discredit the instrument because it has a character of its own. It could not be an instrument otherwise. The universe in its own selective movement forged it, in the long ages, for just such a world as ours and such needs as ours. The possibility of its conquests are but dimly foreshadowed as yet.

The important thing is that our concepts shall work; that they shall blend into the concrete process of life for which they are made, and out of which they are selected. If they are relevant, they cannot be arbitrary, — not "appearances" in the sense of unreal, even though they are at best abstract aspects of reality. They are not only convenient tools, but part and parcel of the world which they enable us to predict, use, and appreciate. To criticize thought independently of its function in experience is as senseless as would be a baby's criticism of its fitness for walking by an abstract examination of its anatomy. The impulse to walk and the development of the anatomy are part of a single movement. We learn to walk by following the impulse to walk; and we learn the nature of things by repeated efforts to use the instrument of thought. In each case, the implied faith is justified by its success.

While we must have faith in the relevancy of thought, we must not prejudice the outcome of thought's experiment by our assumptions. Perhaps it is not true that the object, in order to make a difference to our reflective purposes, must itself be purposive through and through. Perhaps, on the other hand, reality is more rational than our ignorance and impatience assumed. Perhaps there are no simple entities, except as we so treat them for our pragmatic purposes. Perhaps relations cannot be resolved into either the internal or external type exclusively. Perhaps our values may be guaranteed, or at any rate have all the guarantee they do have, in a pluralistic and temporal world as well as in an absolutistic and eternal. At any rate we must be free to follow the leading of our experiments. The postulates of thought and the postulate of their relevancy seem to be all that are required in so fundamental an inquiry. And these too must be justified by their success, for the laws of thought can rise to clearness and distinctness only through their use.

For the dogmatic method, too often applied in matters of philosophy, we must substitute the empirical or critical method — the method which the special sciences have proved so fruitful in their own domain. It is not the province of metaphysics to dictate to reality what it must be, but to discover its fundamental meaning. It is only when pursued in this spirit that metaphysics can take rank as a science, and, at least in its ideal, as the science of sciences.

The Function of Metaphysics

It has been asserted that the acceptance of philosophies has nothing to do with their truth, but with their congeniality to people's passions and prejudices. This seems indeed to be true to a large extent in our imperfect and uncertain evolution, where our mutual blindness plays such a large part in the acceptance of beliefs. It often seems, in the snail's pace of the many, that ideas only gain acceptance after they are antiquated and then as obstacles to further progress. Thus Aristotle is accepted as a dogma to defeat the progress of modern science. It would seem that society, by the very law of its development, is bound to feed upon the illusions of yesterday. Its progress is ever unwilling. It is ever moving with its back to the light. It is ever making martyrs of its prophets.

In thus arraigning society, however, we are losing sight of the fact that human nature has other claims to satisfy beside those of pure truth. The primitive law of society, as of the individual, is self-preservation; and to this end it must ever watch with jealous care the introduction of new gods. Individual insight is ever the disturber of the social equilibrium, which insists on standardized beliefs. The human Prometheus, therefore, must pay the penalty of his profanity in stealing fire from heaven. The new claims must be put upon the rack and tried out with reference to the other claims of human nature, before the social instinct of self-preservation is set at rest. It is useless to rail against this law of nature. We are all part of it. Our tolerance extends merely to the trivial. When any profound revolution is threatened, we agree that it is expedient that one man suffer rather than the whole people perish.

If we were merely logic machines, materialism as a philosophy would doubtless triumph. The mechanical view has certainly the advantage of simplicity. But the simplest theory is not necessarily true. A theory must be sufficient as well as simple. It must be capable of harmonizing all the claims. And the facts may be richer than materialism, with its mathematical models, assumes. The universe is not merely a place for the play of our logical faculty. It must in some way own our other ideal demands. Philosophies must do justice to our whole human nature. They must satisfy our emotional and volitional nature, as well as our intellectual. And society has always regarded logic as secondary to its security and happiness. We build philosophies and air castles for the spirit, as we build houses for the body, to keep out the blast and cold of an unfriendly and fickle cosmic weather. Philosophy has its value in appealing to our sentiments of courage and justice, of love and hope, as well as to our sense for fact. When we are hit by the blind vicissitudes of fortune, whether the scourges of nature in the form of pestilence and famine or the human curses of envy, hatred, and malice, it is well if we can say with Socrates: "No evil can happen to a good man either in life or after death."

And so it is that the agnostics and sceptics, brilliant though they may have been, and though the advantage of logic has often been on their side, have scarcely counted in the history of society. They are the mere curios of the philosophical closet. If they have been preserved, it has been only through the social indignation and refutation which they have occasioned. The effective systems of philosophy are tremendous affirmations of faith — faith in human society and its underlying ideals. While one set of facts may apparently be as true as another, some facts are *worth* more than others in the economy of human life. Since truth is a program of life, such emphases as open up the future, as furnish the largest scope of activity, naturally prevail in human interest. Hence, idealism will always triumph over materialism, even though the latter may be more economic; for philosophy exists in part for ennobling life, for enhancing the prospect, not merely as the echo of a day that is gone, of a life's sun which has known its setting.

Idealistic systems have, one and all, been romantic exaggerations. But they invite to effort and melioration, to faith and hope: "God's in his heaven, all's well with the world." The fault lies in us, and can be cured. The exaggeration of promise serves as a compensation for the seeming bankruptcy of our temporal life. The greater the odds, the greater is the intoxication of hope that is required to balance. Hence idealism has flourished best in the face of national crises and misfortunes, whether in an Athens stripped of its power, an exiled Israel, or an over-run Germany. It is then that the kingdom-not-of-this-world stands out in strongest relief. The romanticism of youth will always be indispensable for overcoming the disappointments of our work-a-day life. The faith of a Plato that only the Good is ultimately real; of a Kant that our moral consciousness legislates to the universe; of a Fichte that the world of sense, stubborn though it be, is but the staging and raw material for realizing the moral law; of a Hegel that, in spite of all seeming blindness and chance, the world is a rational whole; of a Royce that loyalty to the ideal is the supreme key to reality — all these are noble poems which, even by their exaggerations, will continue to inspire the race, long after the more rigid systems are forgotten. Friendship, love, and hope require idealization to live; and so we need the exaggeration of the romanticists. Since in ultimate things we can know so little that is true, human nature will insist on holding fast to that which seems to it a good, trusting that in the end this may lead it nearer to the true.

Is this idealizing function of human nature altogether an illusion? It must exist for a use, prominent since it is in the evolution and welfare of man. There are two views possible of this function. We may regard it as a sort of protective covering provided by nature for a highly sensitive animal against the icy blasts of circumstance, to shield him against inevitable disappointments; or we may regard it as the small voice of the universe, however imperfectly understood. In the former case, it becomes indeed an unaccountable illusion, which fails of its purpose the moment man ceases to be the dupe of nature's trick, and learns the profound lesson that there are only atoms and the void. In the latter case, it points to the true vocation of man.

Since the function of both art and metaphysics is to idealize life, to grasp its deeper meaning, the relation between them has often been emphasized. It has been pointed out that their motive is fundamentally the same, viz. the discovery of harmony. For Poincaré it is "harmony expressed by mathematical laws. It is this harmony then which is the sole objective reality, the only truth we can attain; and when I add that the universal harmony of the world is the source of all beauty, it will be understood what price we should attach to the slow and difficult progress which little by little enables us to know it better."[1] But though the same feeling for unity and fitness underlies both activities, neither the method nor the result are the same.

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[1] "The Value of Science," p. 14.

We cannot agree with those who would substitute the mystical and artistic approach for the logical, and who insist that, in order really to know, we must supersede thought by intuition, logic by immediate appreciation. It is true that both in art and metaphysics there must be analysis of the primitive situation. In each case, these aspects must be supplemented with the concrete fullness of experience in the realized purpose. But in art, this supplementation must take place by means of spontaneous suggestion, in metaphysics by awake and articulate recognition. In the former, the instrument or leading fuses with the totality sought; in the latter, the externality of the instrument to its outcome is emphasized. In art, the selective activity is for the sake of permanent objects of enjoyment; in metaphysics, for the sake of understanding. Metaphysics is science, not art.

Problems of Metaphysics. — Metaphysics has been spoken of as the common corridor of the specific types of idealizing activity. As a corridor it serves a double purpose. It opens up into the special compartments of truth. It implies, and furnishes the inspiration of, the special sciences. It is the expression of the underlying faith which leads man to seek for unity and wholeness in our seemingly chaotic world. It is indeed the oldest of the sciences — the mother of science. It is also the terminus and clearing house of the specific activities for truth. It deals with the common and overlapping problems, left over by the special sciences. It is thus the heir of the sciences. It must ever be present as a regulative ideal in all our search for truth. It indicates the ultimate direction and meaning of all our ideal striving. Historically and logically, therefore, it is the Alpha and Omega of our attempts to understand and appreciate our world. Like a perspective from some high mountain, it necessarily blurs details in emphasizing the main contours of the landscape. At best, it is an outlook rather than an absolute scheme, a temper of mind rather than a finished result. But as such, it corrects our partial emphases and conduces to sanity. Often misunderstood, it cannot be avoided so long as we have last beliefs, and act upon them.

It has been customary to divide the problems of metaphysics into two types — ontology and cosmology. Ontology has dealt with the problem of being or stuff. It has attempted to answer the question whether reality consists of such stuff as dreams are made of, or the seemingly solid stuff of sense qualities, or a combination of the two. It has also examined into the factual relations of things, such as causal, spatial, and temporal relations. Cosmology, on the other hand, has been concerned with the ultimate form, purpose, or meaning of our world, and has been closely allied with religion. The division does not seem fortunate, since the aspect of form or purpose has as real an existence as the stuff aspect and its factual relations. Hence there has necessarily been a great deal of confusion and overlapping.

The division of problems in this book is based upon certain ultimate and generic concepts, viz. energy, consciousness, space, time, and form. Those who cling to the traditional division of ontology and cosmology may find solace in the fact that the first four parts, viz. those that deal with energy, consciousness, space, and time, may be classed under the traditional heading of ontology, and the fifth part, which deals with form, under the heading of cosmology. The old heads, however, have little pragmatic value and should give way to a more scientific division of problems.

I have departed from the old custom of giving a cut and dried summary at the beginning. Instead of that, I have tried to give a concrete picture of the problems in the first chapter. Philosophy must begin with intuition, however severe may be its method. It is hoped that this imaginative statement may be a help to the elementary student, even though it offend the pedant. A more technical summary will be found in the last chapter, and the professional philosopher may prefer to turn to it at the outset.

A REALISTIC UNIVERSE

CHAPTER I

Perspective: The Divine Five-fold Truth

It is the holy stillness of night. The world with its busy cares is asleep. And that is the witching hour of divine philosophy. In the silence, a Spirit comes to me and bids me write. Is it inspiration? Or is it the fever of the night's vigil? I do not know. But, somehow, my soul seems calm and I seem to see in a sort of mystic way the meaning of things which were dark before. At least I will obey the muse to-night and trust in the leading of the Spirit, for this seems like no human insight. Tarry, sweet Muse. The night is young. I would fain revel in glorious discourse. At other times I have spoken through the long processes of logic. To-night, I would fain speak as an oracle.

The Divine Truth of "Being"

First of all, there comes to me the old and divine truth of "being" — not static, inert "being," but constellations of energy, conscious and unconscious, interlocking and interacting in space. Worlds rise and dissolve like smoke wreaths, with ever-varying cadences. Yet through all the shifting forms laws prevail; and we gnats of a day, that are borne upon this stream of change, can, to a degree, forecast the future from the lingering shadows of the past. In each stage of creative transmutation, reality speaks to those that can understand: "that am I." In spots, and for a cosmic instant, energy collects and condenses into material centers. These centers, through their mysterious, dynamic threads hang together as a whole. You can pass on the light beams from one to the other, even to the last. They dance together in mathematical rhythm in cosmic space; and, in the infinite ages at least, carry on a fair exchange of measure for measure. And part, at least, have life and mind and can catch the meaning of their relationship.

Spinoza, the God-intoxicated, had a vision of the universe as two winding corridors; each variegated fresco of one is imitated in the other, for the order of thought and things is the same. Each voice in one has its echo in the other, for the mind is the idea of the body. Proceed as you may through the infinite windings of one, no window opens into the other. But if eye hath not seen nor ear heard, and if it hath not entered into the thought of man that there is another half-world, is it more than the shadow of man's mind? And if any one doubts the existence of the other corridor, who shall prove it? Spinoza, in the passion of his fancy, supposed that if things exist, and if we become conscious of things, then things must be repeated. But things are just such as we must meet them and appreciate them in the wide, common corridor of experience. No blind wall separates experience from the world of its interest and love; thoughts and things are part of one divine context. It is through thoughts that we can use things, and things become significant by entering into the context of thought. Thought and things are not two halls, but relationships within one dynamic living world. There is only one window to the significance of the world of things, and that is thought, though things may hang in their own context, without being thought.

Whatever varieties of energy science may establish, whatever identities and equivalences it may trace in the flux of process, one thing is sure, mind which passes in survey the motley array cannot be declared unreal. For mind alone knows itself first hand for what it is, is aware of its own activity and meaning. Whether we find it convenient to make mind thin enough to cover the whole extent of being, or must recognize other types of energy, at any rate mind can never reason itself out of existence, can never make itself an accident in a world which sets itself the vocation to understand and control. Mind by virtue of its history and claims must be fundamentally at home in the universe. Its purposes alone can make clear the grades and complexities of "being." Mind is not a by-play but, in the words of Plato, "a noble and commanding thing."

But "being" is not, as falsely supposed by many an inspired genius, the only door to reality. It has been the habit of man thus far to emphasize some aspects and read out other aspects of reality, according to his temperamental, intellectual, or practical bias. In this he has usually been right in the importance of the aspects he has read in, and wrong in the aspects he has read out. Thus the Eleatics of all time are quite right, that there must be "being" — stuff, constancies, thickness, grist. But because there must be thickness, must there be absolute thickness, absolute constancy? Could not science and practical life get on with relative constancy? So far as our experience goes, we do so get on; and in a manner find our way from part to part within the checkered woof of reality.

The Divine Truth of Time

Instead of writing a poem to the solid, as Parmenides does, why not write a poem, as Heraclitus does, to divine flux, with all its sadness and novelty? Our hopes and aspirations, as well as our doubts and fears, are built upon the consciousness that the universe is not absolutely made, but in the making; that the future may divorce the present, however firmly thought and its object are wedded now — sometimes by altering our attitudes, when the facts we intend seem constant; sometimes by altering the facts in conformity with our more constant ideals. But our attitudes are facts, too, part of the dance of attention in the ever-shifting focus of object and interest in the drama of experience. Like a magician, time converts the death of winter into the bloom of spring. Like dew upon the flowers, it makes childhood open into youth. Like summer it comes into our veins. Like a lapwing in the night, time steals upon us and we are old. Even while we sleep it transforms our values and purposes. Like moth and rust it creeps into our equations and facts. However viewed it is true that reality is vibrant, that it is ever in solution, that it glows. And no static view can ever piece together this motion and life of real process. We can hold only part of reality in the net of our concepts, the rest trickles through. And while the constant residue is more important for science, what trickles through may be the more characteristic of life.

True, we cannot prove from the fact of change, any particular change or rate of change, nor deny any particular constancy.

The processes of the universe travel at diverse paces. We must take the substances of the reality which time transforms, each after its kind. But we can prove that if there is change, there must always be change. For, in the infinite æons, if time or change were finite, it must have run its course untold ages ago. Change must be taken as real and underived, prior to all our ideal measurements, if it exists at all. This change value, I call time. Let the pæan be chanted to eternal time — double-visaged time, with hoar frost on the brow looking backward, and the fire of youth in the face looking forward, fading Autumn and budding Spring in one.

If we center our interest on the flowing, the novel and the irreversible, we can easily fall into the mood that only the flow is real; that the flux is absolute and that there is no such thing as constancy, or truth even in part; that the *transforming* of the stuff of meanings and of matters is the real and that uniformities are but illusions. With Omar Khayyam we may come to say:

> "One thing at least is certain — *This* life flies:
> One thing is certain and the rest is Lies;
> The flower that once has blown forever dies."

Yes, all that is born in the pangs of earthly beauty shall fade and die. This would be infinitely sad, if spring and youth were not reborn with new beauty at the turn of the year. But while "the bird is on the wing," why deny such seeming perchings, such constancy as there is, such prediction as experience proves? While the hues of the shadows flit and blend into each other on the face of the mountain in a thunderstorm, still the outlines of the mountain show us the course of the change; and while the torrent hastens to the sea, the scenery of the banks helps us to gauge its swiftness. So do the more permanent fringes of meaning and tendency help us to take stock of the fleeting values of our own life.

The Divine Truth of Space

And why should not some one write a poem to the void — the glorious expanse of space? For what a congested world this would be if it were condensed into a mathematical point — no looking at each other, no embraces, no starry heavens, no gravitational equipoises of swinging masses, no differentiation of individual centers, no canvas for the cosmic artist to spread his sunsets on, no marshaling of the ranks of tonal harmonies as a result of this absolute condensation—all for want of room. If you have space, you can put as many holes into it as may be necessary, shooting it through with energetic centers, conscious and non-conscious. You can stretch your gravitational threads, you can pour in your luminiferous ether and spread out your electro-magnetic field; you can fill it as full as imagination and convenience may dictate. On its neutral background you can paint as great a variety of star patterns, of cosmic tragedies and comedies, as the necessities of nature and the artistic genius of the universe may prescribe.

I would not make space everything, carving a world out of it by means of geometrical figures as some have done. *Our* imagination at least is too finite to create a universe out of nothing, whatever an infinite mind might do. But, in any case, you must presuppose your space, which you so thanklessly ignore, to have your side-by-sideness of centers, your free mobility, your perfect conductivity. No hindrances there to the wheels of Charles's Wain, no opaqueness to the mercurial messengers of light, — only sublime distances making feeble man's artificial measures, where constellations dart through space to the Pleiades. Viewed from the side of space, your bodies and energies become interferences — departures from the pure limit with which we start.

It is true that in the poetry of science, the limitations of space are being annihilated for many practical purposes. The electric network of nerves under human control binds humanity together for social sympathy and coöperation as never before. But it is also true that science has revealed the wonders of space to us in a new light, as its equations of distance, both in the large interstellar world and in the minute interactions of things, bankrupt the resources of our imagination. At any rate, so long as distance thwarts the will's realization in the handclasp of loyal men, the meeting of fond lips, and the embrace of loving hearts, space must be recognized as real. To divine, neglected space, bespangled with many a star for diadem and begirdled with lightning, let my song go forth.

The Divine Truth of Consciousness

And what shall I say of consciousness, illuminating nature, the manifold world of process and its flow? To be sure, it would not appear except for the complexity of the world of process — its organs and contexts of relations. But they in turn would have no significance or value apart from the divine light of consciousness. It was a noble insight, that of the Sankyah philosophy in far-off days and climes. It is only as nature (Prakriti) develops senses and intellect on the one hand, to match the motley variety of the world on the other, that consciousness can illume the world. It is nature that furnishes the subject and the content too. Consciousness is a neutral light. It adds only the awareness. It cannot be responsible for plurality of egos, any more than for unity, as the Sankyah supposed. Nor does nature vanish with consciousness, but with it becomes significant nature, aware of its pulse beats and its destiny. In itself, consciousness has no variety, no color, no direction. But with it comes to light the color and variety and meaning of this whole checkered, flowing world. No wonder the Sankyah philosophers, with their longing for mystical peace, for the negation of strife and variety, centered their gaze on neutral consciousness and allowed nature to vanish with the abstraction of attention.

How long before the mysterious awakening; what vicissitudes of change; what migration of spirit through cosmic spaces; what dizzy ages of evolution of organs and of mind, before my spirit saw the light, who can tell? Who can follow the journey of mind through geologic ages? Who knows whether it is a hardy native plant, grown up in the cosmic weather of our earth, fraught perhaps with unconscious memory, chastened through suffering, selected by nature's breeding from the simpler stages of life below; or whether it is a divine gift, groping its way in the dark to its father's house? But when consciousness does illumine the patient face of nature, what beauty of significance is there — in part expressed; in part vaguely felt and only half understood. What opportunity is there for sharing in the directive creation of the divine destiny, which nursed us to this end. Elsewhere, no doubt, the light has shone before; soon the light here shall flicker and go out again, as the soul goes forth to its new mysterious birth. All this — the before and after — is hidden in the night of our ignorance, but how glorious to be awake just now, to catch to-night this glimpse of the eternal procession of the ages. Whatever may be the destiny of mind in the cosmic whirl of change, thank God for this.

When I take my journey in the sea of energies, midst ethers and star dust, perchance through skies and clouds to stars unknown, perhaps to linger here midst dance of circumstance, who can tell when and how I shall appear? But I believe that the light of consciousness shall shine for me again; that I shall see anew the glory of God's world; that I shall feel the sympathetic touch in the march of the æons as I never have before. If so, what does it matter how long I sleep, waiting for the call of God's energies to the beauteous vision? To consciousness, lighting the world, in one flash of interest and value bringing groping will and matter face to face, let my hymn be sung.

The Divine Truth of Form

And, then, what hymn can I sing worthy of the glorious divinity of form? For who would want a chaos of moving pictures like the nightmare of a dream? The consciousness of such a crazy quilt would be even less to be desired than the annihilation of Nirvana. But we have the conviction that some facts are worth more than others. In the shifting and relative shapes of the flux, the soul comes to the insight, now and then, of eternal beauty. Restless sound is woven into harmony, the chaos of color into divine form and expression. The world of things, to some extent, can be recreated into the world of ideals. Who can wonder that Plato found the idea of form, of significant unity, diviner than all the flux in space and would allow to worth alone the prize of being?

Let the materialist claim that beauty is a physiological relation; that it depends on a certain structure and its motor reactions. He does not contradict the diviner insight that form — significant relationship — is an original and underived aspect of reality. True, reality must prepare the spirit for its realization and appreciation by preparing the organism. Nature must construct an Æolian harp to vibrate with the universe of tones. It must invent a photochemic film to give us the many colored rays of cosmic light. In the conflicts of experience it must bring to clearness and distinctness the instinct for fitness and order. Beauty and right come to us first as intuitions, before we can understand or separate the form from the matter. But if we are nurtured in the lap of nature to the end that we may become conscious of form and beauty, then it must be true that beauty suffuses the whole of things; that the flux has worth only as it is sifted through eternal form; that nature's beauty and, still better, our conscious creation of beauty, is the imitation of a reality of which we have but a vague intimation, an objective world of form, interpenetrating our world of sense, and, in the long series of mutations and survivals of history, constituting our human nature. Looked at from the side of process, nature is a lavish creator, and some of its gifts also have form as read or appreciated by human nature. This is not mere chance. It is part of the selective evolution of reality, for human nature is part of nature. Beauty is but nature become conscious of its formal character through its more developed organs of human nature. Thus do nature and human nature conspire to produce the sunset and the symphony.

In human nature, nature discovers her own order, recognizes the rhythmic pulse beats of her restless activity. Her immanent tendencies become ideals, her direction organized purpose. And this human nature, while it lightens to an extent the past, is but the prophecy as yet of the larger overarching and overlapping form toward which the universe in its highest reaches is aiming — that free realization of an ideal where work and play blend in the fluent and joyous activity of spirit.

As the music of each passing moment dies into the recessional of the past, one thing remains amidst the changes and chances of clashing masses and souls — the direction of the process. That, at least, is absolute, eternal and divine. What is this direction? Is it more than that the universe in patches expresses ideals and so becomes immortalized? Is there a grand finale? If time is infinite, this should have come to pass infinite ages ago. Yet for a superior insight, the patchwork may be a scheme. That it is so remains for us an act of faith — a faith that, in the drift of cosmic weather,

> "Before me, even as behind,
> God is, and all is well."

This faith like every faith must be justified and transformed in terms of our growing experience. For on the shifting sea of life, the horizon must ever move forward with the progress of the journey, as we steer towards an unknown goal. We can catch the direction in part only by looking backward at the glittering wake of the past. Unseen insights, new adventures, unpredicted accidents confront us in the unknown. But the brave souls who search anxiously for the leading and who follow the light as God gives them to see the light shall arrive. For through it all, we believe, there runs the silver thread of order, the cheering message of the beyond.

The conclusion of my poem, which I can but feebly express, shall be that I own the supplementing concreteness, the real thickness of life as all of these, interpenetrating in one common world. Reality reveals itself in five different ways. It has five windows. It reveals itself to our purposive endeavor as a world of restless energies with their relative uniformities. It reveals itself further as time, which in the flux of selves and things gives the lie to the past and creates for the soul new mansions of meaning and value. We must also orient ourselves to space, the playground of energies where the heavens spread out like a curtain and clouds are moved back and forth as draperies. Under certain conditions of complexity and intensity, the whole is lighted up by consciousness; and lastly running through it all as the invisible warp of the many-colored woof there must be form — the direction which our finite minds strive to unravel. This is the *Divine Fivefold Truth* — the five doors which we must enter if we would bask in the divine illuminating wisdom.

The night is far spent. The intoxication of soul is wearing off. The cock crows, announcing that matins is at hand. The goddess of drowsy slumber will soon lift her silver veil from off the naked earth and depart. The bustling, jostling, wakeful, petty cares will return with the dawn. I thank thee, Spirit, for divine philosophy. May it prove sane when viewed in the glaring light of day. At least the bliss was great, while it lasted. And now into Thy care I commit my mind, while I, too, join the unconscious world in the soft arms of sleep.

PART I

ENERGY AND THINGS

CHAPTER II

BEING — MATTER AND THE ABSOLUTE

THE story of the concept of being is a long one and constitutes pretty much the whole story of philosophy. From Thales down, men have tried to simplify our world by reducing it to some *Urstoff*, some simple entity or entities in terms of which the motley variety of our world might be expressed and understood. It might be water, it might be fire, it might be material atoms, it might be mind, it might be electricity, it might be some combination of elements. In any case the human mind has felt more at ease in the world when it has thus simplified it. But whatever may be our opinion of *Urstoff*, upon one thing we are now agreed, that experience stuff, as revealed in our immediate feelings and sensations, on the one hand, and our purposive construction, on the other, must be the starting point of all our investigations. In terms of this we must differentiate and express the problems of the universe in so far as they can be expressed. But is reality through and through experience?

Is Experience Self-sufficient?

It has been maintained from time to time, and recently by so brilliant an advocate as William James, that experience is self-sufficient; that our hypotheses "lean on experience but experience leans on nothing but itself"; and that we have no need, therefore, of any reference outside of experience. While it is true that the process of knowing must thus lean on experience, must take account of the properties and relations, the similarities and differences, the novelties and uniformities as they appear from moment to moment in the stream of consciousness, this does not seem a sufficient account of reality as a whole. If we examine the implications of experience more closely, we shall find that *our* experience, at any rate, seems to depend in many ways upon an extra-experiential constitution. I shall mention a few cases in which experience, in the sense of conscious experience, implies such a constitution.

For one thing, experience does not account for its own continuity, either as involved in intersubjective relations in space or in the bridging over from moment to moment in time. Let us examine the former type of continuity first: in order for two egos to come to an understanding with each other, or to communicate their feelings and ideas by means of "winged words," something more is necessary than their respective fields of consciousness. Certain instrumental processes must be interpolated. There are the physiological movements produced by the speaker, the air waves of the common physical continuum which takes up these movements, and finally the end-organs and nervous system, reacting to these stimuli. Now these intermediate bearers cannot be regarded as experience in their own right. Even the immediatist, unless he is a solipsist, would have to admit that other people's immediacy is not his immediacy, but is communicated by means of intermediary processes. This would be true even on a telepathic hypothesis. How it is possible, by means of such non-conscious intermediaries, for conscious egos to meet in a common world, we cannot discuss here.[1]

In the second place, we cannot account for the continuity of experience in time, any more than in space, as leaning upon nothing but experience. To use James's illustration: Peter and Paul go to sleep in the same bed; and while not conscious in the meantime, so far as evidence proves, each one, on waking up, is immediately aware of his own past, and one does not get mixed up with the other. Such continuity, bridging over the intervals between our waking moments, must require something besides experience. The reason that experience in waking connects with experience before going to sleep is that both lean for records upon a world of processes which is not experiential. The machinery of association, upon which the living-over of experience depends, is not itself experience. The same idea might be illustrated equally well with reference to social experience or the funded knowledge of the race. Clay tablets, constituting libraries of ancient lore, have been unearthed in recent years in the Orient. These records of stored-up mind became significant anew as experience, after thousands of years, when they were unearthed and deciphered by recent discoverers. Perhaps you retort that they were possible experience in the meantime. But what does possible experience mean in such a case except that they were not experience, until they became continuous, as perception and interpretation, with human beings who stumbled upon the libraries? The phrase "possible experience" only hides the problem; and if it means anything when pressed home, it is that experience sometimes leans upon processes that are not experience. Whether within individual history, therefore, or within the history of the race, it is evident that, when you try to explain its temporal continuity, experience leans upon an extra-experiential constitution.

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[1] See Chapter XI.

What I have shown with reference to continuity might be shown equally well with reference to interest. Take, for example, a case of primary interest. Why do brilliant things, moving things, loud things, things to suck, etc., fascinate the infant? Not because of experience, surely, because it has no past experience to bank on. If we would find the explanation for such interest, we must go back to biological structure and conative dispositions, not to psychological association. We sum it up by saying that the child and the chicken are so constituted as to feel this way in the presence of such stimuli. Evidently experience leans upon what is not experience, as regards primary interest.

If you take into account the more general demands or postulates that underlie psychological activities, they, too, seem to carry us beyond experience. Why is consistency pleasing and contradiction disagreeable to the cultured man? Why do certain forms and combinations of colors and of sounds stimulate him to appreciation and excite the feeling for the beautiful? Why do certain things provoke disgust and other things approval? Partly, no doubt, on account of experience; but if certain instinctive qualifications were lacking, or if the instinctive constitution were different, the same situations might produce entirely opposite feelings on the part of individual experience. In order to understand the learning process, we must take account, not merely of experience, but of capacity. No facilities for education can overcome the native limitations of the imbecile. And capacity cannot, so far as we can see, be reduced to experience. Imbeciles sometimes come from highly cultured ancestry, and geniuses from a background of ignorant but honest peasants.

Not only is the woof of experience-in-the-making thus conditioned by an instinctive warp which experience presupposes, but culture and meaning, the net result of experience and tendency, are funded in a way which, to a large extent at least, is unavailable as experience. Physiological and conative tendencies come to do the work of memory. It is precious little that a man out of college twenty years, and engaged in new pursuits, can recall of his college curriculum. And yet he feels differently and acts differently because of his college course. Here, again, in the very definition of culture, we come upon a subtle relation to reality which is not experience. The ego, therefore, whatever else it may be, is not merely a "bundle of perceptions" or of any other conscious states. They are not the whole story, at least.

Another road might have been chosen to show the insufficiency of experience as an account of reality. If we take the immediatist point of view, what reality can we accord to nature? Is nature merely a "bundle of perceptions?" We have already found such an account inadequate to the ego; on closer scrutiny we shall find it equally inadequate to account for nature. If we insist that the objects of nature are statable merely as our perceptions, we must be prepared to answer several questions. Does reality consist merely in the perceptual differences that things *do* make, or does it also include the differences which they *can* or *will* make under other conditions than the present? If we admit *will* and *can*, have we not implied a larger constitution than experience? And, then, what about the constancies or uniformities in our perceptions, upon which all our expectancies or scientific laws are based? Is the recurrence of perceptions in different moments of the temporal stream, itself brought about by perception? Is it part of perception that perceptions shall repeat themselves in certain describable and definite ways? But if perceptions do not exist in the meantime, it is hard to see how this repetition can be a character of the perceptions. If *esse* is *percipi*, it is hard to see what reality there can be when there is no *percipi*. In the prediction of an eclipse a thousand years from now, or the reading of an eclipse a thousand years ago, there surely is no present perception of the fact; and absent perception is hardly perception. If there can be such a thing, then, as future perceptions or the reading off of past perceptions, experience must lean upon a non-experiential constitution.

This is not the whole difficulty of the phenomenalistic theory of nature. A further problem confronts us. Can an individual, whether conscious or unconscious, be resolved into external relations? Can reality be regarded as having merely an outside and no inside? By thus regarding it we shall, indeed, avoid the knotty problem of the "thing itself"; but is our account of reality fair and complete? Is reality merely what it does, in the sense of external continuities, waiving for the time being the difficulty of what it may do? In the case of one sort of individual at least, namely the purposive ego, we must admit that he is not merely what he does, not merely the perceptions he produces in us; but he is also something on his own account, a center of at least possible appreciation and willing. This is the real core of the ego for our practical social relations, not the external and adventitious ways of taking him — not his side-by-sideness or likeness to other individuals, not the sensations of the sight-touch-motor complex. The latter for the deeper purposes of our personal relations are merely signs — the clothes, or part of them; and a self consisting merely of clothes would be a funny sort of an individual. The ego, to use a good Hegelian distinction, must be something *für sich* and not merely *an sich*, a meaning and value on its own account as well as something for others. If only purposive beings have an inside, is the baby merely an outside, merely clothes? It seems to have a core of feelings of its own, however crude. It is an object of will and appreciation, of hope and love. And what about animals? Are they merely our perceptual outside with no inside? No, they, too, seem to have a core of appetite and feeling which we must acknowledge. And while we know little about the inner life of the simpler forms of nature, at least they are not merely fictions of ours. Our agreements about them are forced agreements; they are not created by convention; and we must learn to adjust ourselves to these simpler realities in order to control them and to realize our purposes. If we would keep dry in the rain storm we must bring our umbrella and wraps along. While the physical object can to a degree be sensed, while it can even for certain purposes be stated as more or less "permanent possibilities of sensation," its existence is not constituted by our sensations. Approaching the problem as we must from the point of view of our active purposes, we cannot resolve reality, whether conscious or unconscious, into bundles of perception, or into experience of any form, altogether. We must interpolate, somehow, realities which are not immediate experience.

Two Hypotheses

How shall we conceive this larger constitution? Two important hypotheses have become classical, one that of independent and immutable substances, and the other that of the absolute. First, a word as regards the hypothesis of substances. The realistic substances may be material or spiritual; they may be the extended, impenetrable atoms of Democritus or the Leibnizian monads — non-extended, windowless soul-points, representing in an ascending scale of clearness, the entire universe. It is quite wrong, then, to accuse the older realism of being materialistic. On the other hand, the substances which have counted in science have, until recent times, at least, been of the extended or material order. The monads of Leibniz and the qualities of Herbart have not counted in the development of science, interesting though they have been as metaphysical curiosities. The atomic theory of Democritus, adopted by modern chemistry and made exact through Berzelius's conception of weight proportions, has, on account of its convenience for scientific description, come to stand as our ideal of atomic realism.

In the older conception of atomic realism, the geometric properties, depending upon extension, are the important ones; even after the idea of energy, in the sense of doing work, became a permanent concept in physical science, the concept of extension was long allowed to rank with the concept of energy. This gives rise to Herbert Spencer's antinomy as regards extension and force. This antinomy, however, is losing much of its relevancy by the fact that extension is relegated to a secondary place in the scientific conception of physical nature.

Some philosophers and psychologists maintained long ago that extension is a "confused idea" and has no reality outside of individual experience. Berkeley pointed out, with his psychological keenness, that the size of a thing varies with the distance and that the form varies with the angle of perspective. He concluded, therefore, that matter, being thus relative, could not be objectively real. Modern psychology, with less of metaphysical interest, but with superior experimental tools, has likewise pointed out the relative character of extension. Thus it is shown that the extension seems longer when the intervening space is filled than when it is empty, whether you take tactual extension or visual extension. Where the area is too small for two points to be discriminated as two, they still furnish the sensation of a bigger point than either of the points separately applied. When a given number of points are made to stimulate the skin cells or the retinal cells successively, the extension seems larger than if the stimulation is simultaneous. Even as regards sound, we find an interesting relation between the rate of succession of physical stimuli and the sense of volume. Sounds succeeding each other, approximating the rate of $\frac{1}{500}$ of a second cannot be discriminated as distinct sounds. We cannot here distinguish even between the duration of the successive and the simultaneous, but the successive feel bigger than the simultaneous.[1] Not only the velocity of certain electric currents, therefore, but a certain velocity of nerve currents produces an apparent mass.

Modern physical science, however, has been quite untouched by psychological investigation. What physical science has been concerned with has not been perceptual extension with varying conditions, but an artificial unit of extension under standard conditions, as, for example, the steel yard kept at a certain temperature, and other uniform conditions, in the British Museum. As long as this conventional unit could be applied under definite conditions, extension still maintained its hold as an ultimate attribute of physical reality. I say physical reality because the field of investigation, where extensive units have been applied, has been narrowed down to this. Philosophy since Descartes has recognized that there is no sense in speaking of an extended will. Even in physical science, however, serious doubts have arisen, though on experimental and not *a priori* grounds, as regards the absolute character of extension and even of weight. What has given rise to this doubt in recent science is the demonstration that neither extension nor weight can be regarded as an absolute constant, and that, therefore, recourse must be had, for descriptive purposes, to a more ultimate concept. It has been shown by Lorentz that even mechanical mass in motion must vary with the electrodynamic field, and so is not constant. Gravitational mass, moreover, does not seem to apply with equal force to all energy; there seems to be little relevancy in speaking of electricity as having gravitational mass.[1]

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[1] See Chapter XIV, p. 260.

Recent investigations into the nature of electricity have shown that mass can actually be produced through velocity. Kaufmann, J. J. Thomson, and others have demonstrated "that if the velocity of a charged body is comparable with that of light, the mass of the body will increase with the velocity."[2] And not only that, but the experiments and calculations according to Thomson, "support the view that the whole mass of these electrified particles arises from their charge."[3]

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[1] See "Electricity," by Gisbert Kapp, pp. 10 and 11.

[2] J. J. Thomson, "Electricity and Matter," p. 34.

[3] It is only fair to say that Thomson in more recent publications has modified his view. As I understand it, he does not now regard it proved that the sum of the apparent masses of the negative charges equals the total mass of the atom. There is a residuum of gravitational mass which must be accounted for in other ways. This is now a matter of controversy. But in any case the Cartesian idea of atoms as rigid, mathematical figures has been exploded. Both the shape and the magnitude of the atom vary with the velocity and the magnetic field. They can be changed by pressure. Energy, not mass, becomes, therefore, the primary physical reality. The atom, Thomson has shown, can be stated as the sum of its internal energy and the energy of translation.

A number of brilliant physicists, including Rutherford, Strutt, etc., take the view that the atom can be resolved into negative electric charges held together by positive electricity spread over a wider volume. The conclusion of these investigations would seem to be that there is "no mass other than electrodynamic inertia. But in this case, the mass can no longer be constant; it augments with the velocity and it depends on the direction, and a body maintained by a notable velocity will not oppose the same inertia to the forces which tend to deflect it from its route as to those which tend to accelerate or to retard its progress."[1]

The new investigations, so far from disproving the descriptive significance of the atom as it has figured in physical science, have on the contrary furnished experimental corroboration of its existence and character. Whether the hypothesis of positive electricity proves to be more than speculative, it remains significant that the mass of the atom as now measured coincides with the mass of the hydrogen atom, and this would seem to furnish additional evidence for the hydrogen atom as the atomic unit. There is little in common, however, between this present atomism of the electrical school and the old speculative atomism. In the new atomism, energy has become the chief interest rather than extension or weight, and it has been confidently asserted that these can be reduced to motion and distance. The atom is no longer regarded as eternal, impenetrable, and indifferent, but as the storehouse of pent-up energy of enormous quantity, though, as in the case of radium, it may be in a very unstable equilibrium. Instead of impenetrable, inert bits, we have now to deal with electrical charges of a positive and negative kind, although it may still be convenient to speak in terms of particles or corpuscles as vehicles of charges. Instead of the mythological "bonds" of an older chemistry, we have the relation of positive and negative charges to each other. Atomic relations are explained by the fact that atoms can, under certain conditions, receive or expel particles, in the former case increasing their negative, in the latter their positive, charge. By the conception of this electrical atom and its simpler elements, the electrons, which bear very much the same relation as regards distance that interstellar masses bear to each other, the electrical school strives to find a common denominator which, through the stability or instability of the structure, can account for the scale of physical changes from the ordinary chemical elements to the strange behavior of radium. And it has even been suggested that nerve energy and mental energy are "inductive" relations and can be reduced to electrical phenomena. Thus this school feels that at last the old dream of one ultimate *Urstoff* has been attained. We have, instead of the old material pluralism of the atoms of Democritus, with their dependence upon mechanical contact, a new energetic pluralism which is capable of constituting its own continuum over intervening distances by means of energetic charges, whether within or outside the gross atom of chemistry.

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[1] H. Poincaré, "The Value of Science," *Popular Science Monthly*, Vol. LXX, p. 349. For the electrical theory of matter see the lucid exposition by Hon. R. J. Strutt, in his work entitled "The Becquerel Rays and the Properties of Radium," especially pp. 184–193.

Possibly the seventy or eighty elements of modern chemistry may be simplified by means of such a theory, but of such a simplification, we have only hints at present. The recurrent similarity in the geometrical groupings which free magnets spontaneously assume in an electromagnetic field when you increase their number, as shown by Mayer's experiments, furnishes a direct analogy to the periodic law of the chemical elements and to the recurrent characteristics of these elements as shown by spectral analysis. The positive or negative chargeability of various elements shows at least an intimate connection between them and electrical energy. This theory tries with wonderful plausibility to account alike for the stability of the ordinary chemical elements and the instability of the radio-active substances; but its most interesting aspect to us is that, like the earlier metaphysical theories of Leibniz and Boscovich, it reduces mass to energetic terms. Thus in modern physical science we have passed from the Cartesian conceptual model of rigid geometrical figures enclosing extension, to one where extension is regarded as a function of energy.

While it is clear that the concept of matter must henceforth occupy a secondary place to that of energy, it would be a mistake to suppose that the concept of matter has lost its usefulness for scientific and practical prediction. On the contrary it has come to have more definite meaning. What has been established is that matter must be explained in terms of energy rather than energy in terms of the interactions of inert matter. Matter is an ensemble of properties within certain energy systems, as taken account of by our sight-touch-motor perceptions. It does not, however, depend for its existence upon our perception. The action of gravity fortunately is the same whether we attend to it or not. So are the size, density, and other properties of things. While, furthermore, the properties of matter such as extension, elasticity, impenetrability, chemical affinity, weight, etc., must be regarded as relative to energy systems, they are none the less real and predictable, once we define our energy system. The empirical generalizations of physics and chemistry, based as they are upon observed properties, cannot be disturbed by revolutions in scientific theory. The laws of mechanics are being applied in the new fields of investigation. Electrons act inversely as the square of the distance, according to the parallelogram of forces, etc., even though it seems that particles at rest repel each other, and particles moving side by side attract. While the electrical theory has tried to account for the gravitation mass of the atom by assuming a sphere of positive electricity, round which the negative electrons revolve, no evidence exists as yet for positive electricity. All we can say is that positive electricity is the property of the atom when negatively charged particles are emitted. And if it were proved to exist as an entity, it would in no wise affect the material properties, as already known, of the energy system which we call the atom. Whether the properties we associate as matter exist in all energy systems can only be determined by scientific experience. We can make no *a priori* analytic judgments as to their presence. But even if they don't, that does not invalidate their presence and validity within energy systems where they are known to exist.

What we must not forget is that matter is a pragmatic concept, and the ensemble of properties which constitute matter, pragmatic properties. They must be taken for what they are known-as in specific energy systems. Extension is, for many practical purposes, an important quality of our material world. It is presupposed in our units of space measurement. If we buy a suit of clothes, we want the right dimensions. If we acquire a piece of land, we want the right acreage. That extension is not a property in the abstract, but the qualification of an energy system, depending so far as our perception of it is concerned, upon the number of processes, peripheral and central, which are stimulated; that it varies with motion and pressure, etc., does not make it any less real within the conditions defined by experience. Elasticity on any theory of matter still remains, for our senses and physical instruments, a property by means of which we can distinguish some bodies which tend to resume their former state when strain is released, from bodies which do not possess this characteristic, and deal with them accordingly. Solidity is still the inertia opposed to the pressure of active touch or other pressures. In ordinary experience it is relative, to be sure. But a bar of steel at low temperature is practically solid. When it still yields to enormous pressure, as Professor Richards has shown, this doubtless indicates the overcoming of the inertia of the atomic structure. But there would seem to be a definite limit, whether reached or not, where bodies are incompressible. Chemical affinity still remains a tendency to selective behavior among some chemical processes under certain conditions of temperature, electrolysis, etc. The property of weight which, with its implication of other properties such as extension, may be said to be the pragmatic equivalent of matter, remains fundamental for certain purposes on any theory.

In each case of these and other properties, the property must be taken as relative to its energy context and as varying with this. Take weight for example. This is clearly a property depending upon an energetic system, little though we know about its structure. Weight is dependent upon a relation of masses and varies inversely as the square of their distance. It is a constant, for practical purposes, at a given point on the earth's surface since the mass of the earth increases but slowly. The weight of a body, under ordinary conditions of motion, constitutes its inertia, and when we speak of the conservation of matter, we mean the conservation of weight. In the words of Simon Newcomb: "The weight of a body at a given place is equally a measure of its mass, and the only measure that can readily be applied in practice. Experiment shows the result of the two measures to be identical, since weight, or gravity, and inertia have the same ratio for all substances. All bodies retain their mass unchanged, whatever transmutations they may undergo."[1] But the constancy of inertia or mass is in turn relative to an energetic system. In the case of particles, moving with a velocity approximating light, there is a sudden increase of mass due to motion, beside the original mass of the particles. But whether we are dealing with inertia as gravitation mass or as due to velocity, in any case inertia is an energy category and eliminating inertia means the withdrawal of energy from a given part of space. What has been abolished by modern science is not matter as characteristic of certain energy systems. This remains a valuable instrument of prediction. What has been banished is "inert matter" as a metaphysical entity.

The weakness in the old metaphysical doctrine of realistic substances is that, inasmuch as these substances are independent and indifferent to the various combinations in which they enter, they cannot account for the apparent processes. The rigid material atoms become as useless to account for the physical changes as the soul substances become superfluous in accounting for the stream of conscious processes. The substances, in other words, must be known through their activity; and, therefore, energy, and not substance, becomes the fundamental thing; substances so-called are mere abstractions of the relative uniformities and constancies, physical and psychological, which we observe in the stream of processes.

The other classic hypothesis which tries to furnish a setting for our finite experience, to account for its coming and going and its relativity, is that of absolute idealism. The origin of this theory is easy enough to trace. It grew out of the Kantian doctrine of the unity of apperception. This doctrine merely emphasizes that, in order to be known, the facts must be taken into the system of experience with its laws, and that consequently the world is coherent for us if we are sane. Kant, however, added the gratuitous assumption that the categories of our mind are extraneous to reality and that, therefore, reality cannot be as we know it. We know it as a dynamic world where the properties and laws which pertain to the specific activity system must be empirically ascertained. Kant realized this, but imbued as he was with the old metaphysics of inert substances, he insisted, consistently enough, that we could not possibly know things as they are in themselves. This would evidently have to be by some passive intuition which should not involve the interaction between organism and stimulus. Kant's common sense led him to insist, however, that we should not waste any time over things in themselves, and that for practical purposes, we are no worse off for our ignorance of them, since we are concerned only with the dynamic world as it appears in our experience. And nobody could quarrel with that.

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[1] Article on "Matter," Baldwin's *Dictionary of Philosophy and Psychology*.

The successors of Kant accepted his thesis that reality is only accessible as it figures within our cognitive system with its laws, and that reality for us is unified in being taken up into our apperceptive system with its postulates. They made, however, two important amendments. One is a legitimate one, and implied in common sense, viz. that we must assume that reality is what it is known-as, or as Hegel would express it, that it is the essence which appears. They thus banished the fictitious thing-in-itself. The other assumption, which the epistemological idealists have added, is illegitimate and rests on an ambiguity of language. It amounts to saying that because reality can only be known as *experienced*, therefore it can only exist as *experience*. This had been expressed before Kant in the formula of Berkeley: *Esse est percipi*, or to be real is to be perceived. But for the post-Kantian idealists it signifies somewhat more than that. It means that to be real is to be apperceived or interpreted. Since, moreover, this interpretation, from Kant down, is recognized to be social, and not merely individual, the hypothesis comes to mean that to be real is to exist within the unity of social interpretation.[1] Since this, too, however, is relative, — has a finite beginning and end in time, is subject to error, etc., — to be real must mean to exist within an absolute system of experience. Thus the unity of apperception is converted into a cosmic unity. The emphasis as to the character of this system has varied with the temperament of its advocates. Sometimes it is the logical character that is emphasized, as with Hegel; sometimes it is the ethical, as with Fichte; sometimes the æsthetic as with Schiller, but in any case the assumption is implied that to be real is to be part of a system of conscious experience.

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[1] The social aspect has been emphasized by Royce in "The Problem of Christianity," Vol. II.

Now, there can be no doubt that the contribution of absolute idealism is historically important. It is one of those compensatory movements by which history strives to correct itself. The tendency has been to emphasize too much the material systems of reality, and to regard the mental systems as incidental. The latter must be recognized to be at least as real as the former. Moreover, it is true that the values of our world can only exist within mental systems. The supreme interest of man, therefore, should be man, the interpretation of his ideals and institutions. It was a sound instinct, too, that insisted that the world without, — the larger world of which our conscious moments are transient phases, — can be no less reasonable than the world within, and that the universe, somehow, must respect our higher instincts as it respects our lower. The faith that the laws of thought are the laws of things is at least an implicit postulate of all science. Else the thought function would be as futile as it would be anomalous. And we may assume that the universe has an equal respect for other fundamental ideals of human nature. When, moreover, we approach the universe in its wholeness, we may regard our later ideal systems as a more adequate key to reality than the simpler material systems.

But this does not prove that the simpler systems are not real. Nor does it prove that reality cannot exist except within our apperception systems, be they individual or social, be they perceptual, logical, ethical, or æsthetic. Certainly so far as *our* experience is concerned, we must recognize systems which so exist. And while they must overlap our mental systems to be significant, it is equally true that our mental systems show numerous dependencies upon them in the economy of the life process. While, again, values are dependent upon mental systems, or the various conscious types of selection of our socialized individuals, other qualities and relations need not be affected by being taken account of. We *discover* the ratio of gravitational relations; we do not make the fact itself. Nor is it clear that the universe as a whole must be a system of conscious experience. Conscious experience may well be a characteristic of our peculiar type of interaction with reality — real indeed under its own conditions, but not necessarily applicable to reality in its wholeness. The latter may have no use for sensations or images or words, and yet may be infinitely wiser than our cogitations. The absolute of the epistemological idealists is after all an anthropomorphic projection. "So the Ethiopians make their gods black and snub-nosed; the Thracians give theirs red hair and blue eyes."[1] And while the absolute is more of an abstraction, it is still human nature with its limitations writ large. This comes out with somewhat bizarre humor in the assumption by each absolute idealist that, in unraveling his own mental processes with their idiosyncrasies, he is unraveling the absolute. This is not apt to increase our respect for the absolute, but we may entertain our doubts.

As an ideal of knowledge, we do indeed aim at complete unification of the facts of our world. Even if reality in its wholeness cannot be shown to be a reflective unity of experience, the dream of science must be to weave together our human facts and interests into such a system. Absolute idealism has served to stimulate interest in the logical implications of experience. It also fulfills a religious function in some lives where the æsthetic and intellectual cravings are more prominent than the ethical and practical. But for purposes of explanation, the hypothesis of an ontological absolute is useless. It is not at all clear how an eternal and complete system of experience can account in any way for the coming and going of our perceptions, the tragedies and successes of our empirical world. The absolute as an hypothesis fails as completely, and for the same reason, as the old realistic substances in meeting the world of process. It is barren so far as helping us to make any predictions in our changing world; an entity, which is supposed to explain everything beforehand, explains nothing. We must go to work, therefore, independently of such an hypothesis, æsthetically satisfying as it may be to some, to meet the problems of our finite world of change.

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[1] Xenophanes, fr. 6a, Burnet's translation.

Moreover, as Plato long ago pointed out in the "Parmenides," not only could not such a system meet the problems of change, but the absolute could not know our finite world, nor could we know it. That we could not know it must seem apparent enough, for if we knew what an absolute experience is, we should already possess such an experience, as, indeed, the absolute idealists have not been too modest to claim; but, even in that case, we, after all, know only what we know. The absolute itself becomes merely our construction — our attempt to interpret our finite experience. We have failed to reach the permanent and eternal for which the absolute was supposed to stand. We know no absolute locus in the world of experience. Our absolutes must vary with the growing insight of the individual and the race, with the evolutionary process of human experience. The historic relativity of the idealistic theories would seem to indicate that, in spite of the confidence of such men as Hegel, they had no first-hand acquaintance with the absolute — not even a wink or tip. If we cannot know the absolute, neither can the absolute know us. It could not know our ignorance, our failures, and our despairs as the tragic facts they are for us. We exist, not merely in logical contexts, but in contexts of emotion and action and must be known in such contexts. The very fragmentariness of our human experiences from the absolute point of view would convert our despairs into hopes, our tragedies into comedies, and our failures into successes. Such an absolute, then, even if it existed, could not account for the world of change, with its adjustments and maladjustments and its different levels of appreciation. Like the realistic substances, it is an hypostatization and possesses all the relativity that the unity of finite human experience, which created it, must possess. That which explains process must manifest itself in the process. The meaning we can snatch from the flux of things possesses, indeed, a certain eternity while it lasts. It aids us to prepare for the future. It is prophetic of the larger insight and the larger experience to come. But as for absolute permanence, we know this even less in the field of human experience than in the case of chemical elements. The old static view of being, therefore, has given place to the view of dynamic processes, whether as regards the atoms of the physical sciences or the images and concepts of psychology. Being = energy.

We have tried, so far, two ways of supplementing our momentary individual experiences so as to make social expectancy possible. One way is that of independent substances and the other that of the idealistic absolute. Both roads have led to the same goal, the recognition of process as an ultimate fact. We have seen that "everlasting fixtures," to use Plato's phrase, cannot account for our world. A thing must be known through what it does or can do; it must be defined through its dynamic relations. Elastic balls, geometrical figures, and other conceptual entities must be regarded as, at most, convenient abstractions from the ever-restless processes. Although this has been recognized by philosophers in various ways, it is to the practical working necessities of science from Galileo down that we owe our present formulation of energy.

CHAPTER III

PRAGMATIC ENERGISM

The Nature of Energy

THROUGH a chronic tendency of the human mind, due to the stereotyping effect of language, philosophers have sought for energy as a thing-in-itself. It has long been maintained that we can know only the effects of energy, and the conclusion has been drawn that energy itself is inscrutable and unknowable. If effects or changes are merely external relations, they will indeed show us nothing about things. But it must be clear that such an agnosticism is of our own making. Since the fundamental characteristic of energy is activity, it would seem that the saner attitude is that of common sense and science, both of which estimate energy by what it does. What we know about our world in our experience is meager enough, but we have at least a right to assume that our fragmentary evidence is real so far as it goes. And if energy reveals itself in certain physical and psychological changes, these, we must assume, indicate the nature of energy. We must hold to the pragmatic postulate that energy is what it does. Any other assumption is suicidal at the outset.

Others have insisted that we have immediate and intuitive evidence of the nature of energy in our sensations of strain, our feeling of effort. Now this is true, no doubt, to the extent that, if we were not ourselves active beings, we should not be conscious of energy in nature. The fact is that we should not be conscious at all. Psychological analysis shows that the feeling of effort consists in certain kinæsthetic sensations — sensations of muscular tension about the forehead and in the throat, of labored breathing, etc., when we are baffled by a problem. But these sensations are not mental activity. They are reflexes merely, — symptoms of a somewhat unorganized or obstructed stage of activity. They are not concomitant to all our activity. When the particular activity becomes organized and proceeds fluently and easily, the sensations of strain disappear. But the activity does not disappear; on the contrary it is now most efficient.

Science has followed the pragmatic method and insisted that energy must be known by work done and the sort of work that is done. It is true that in the minds of scientists there have lingered reminiscences of an antiquated metaphysics, of an energy-in-itself, of occult "forces," and "latent" energy. But such misconceptions have had no effect on the empirical results of science. These have to do with predictions of behavior under definite conditions. And by behavior science does not mean merely a sequence of perceptions. The assumption that these constitute the whole story is a metaphysical interpretation of science. Of course we must know reality through our perceptions, *i.e.* we must become aware of its changes. But science does not assume, as phenomenalism does, either that we are dealing *only* with perceptions or that our perceptions of things are "faked" manifestations of an energy in itself. Our perceptual system may inform us of what energy does in systems outside of the cognitive relation. Our seeing the gunpowder, and the spark applied to it, and the explosion with its results, informs us of what is happening in our environment. It is not our perception of the explosion which makes the explosion occur; the work done by the energies involved must be taken account of in their own context. In other words, science is dealing with real activities, as revealed in various contexts, including our perceptual context. Whether again we measure energy in foot pounds, the work necessary to lift a pound a foot in a second, or in dynes, the work necessary to lift a gram one centimeter in a second, is of course purely a matter of practical convenience, and has no philosophic interest.

Work and inertia are merely two different points of view, due to the special interest for the time being. In speaking of work we emphasize the going on of activity in connection with a series or direction which we have selected. In speaking of inertia or mass, we emphasize energy which must be balanced, overcome, or withdrawn. To start a body moving we must overcome its inertia or its energy of position. Again, we cannot annihilate the energy of a moving body. According to Newton's first law, if a certain initial energy is communicated to a body from a definite base, it will move uniformly in a straight line unless interfered with by other energies. Here energy must be withdrawn or transformed in order for the body to stop moving. To eliminate interference, again, means the withdrawal of energy. In our practical social relations, we use inertia in a similar sense: it means energy which must be overcome or withdrawn. We must overcome people's opposition, scruples, or habits. We may be reformers trying to overcome people's prejudices, or we may be confidence men trying to withdraw people's caution. Work and inertia are pragmatic distinctions depending on our special interests in dealing with our world. They hold for all energies, whether it be material masses in space, or electric currents, or social interactions. We can see, then, that inertia is a universal characteristic of energy.

The simplest unit of reality is an energy system. Things do not have properties in themselves; they possess properties only within a system, and such properties vary with the conditions which determine the system. That properties exist in the abstract is one of the last superstitions of the old metaphysics. Take weight, for example, the most important property of mechanical science. Does weight exist in things by themselves? We know that the weight of a body varies at different points of the surface of the earth. It is a function, though we do not know how, of the attraction of the earth. According to Newton's law, bodies attract each other in proportion to the mass, and inversely as the square of the distance. For very large distances, we know now that gravitation becomes negligible; and of course for infinite distance it becomes zero. A body at an infinite distance from other bodies would have no weight, which amounts practically to the same as saying that bodies by themselves would have no weight. If you say that such bodies have potential weight, that is the same as saying that they do have weight when they exist in connection with a certain finite system. The same could be shown for other qualities. Extension is a property things have for us in a certain perceptual energy system. This implies, beside certain external energies, a certain stimulation of the cells of our end-organs, and of our cerebrum. The number of physiological processes stimulated seems an important condition, though the sequence of stimulations must also be taken into account. In any case, extension as perceived is real only in an energy system, and varies with this. And the same is true of the extension of things with reference to each other. It varies with motion, temperature, and pressure. In so far as we apply size and weight to corpuscles moving with the velocity of light, both properties depend largely, if not altogether, on motion. Properties have no meaning for science, except as energy determinations, characteristics within energy systems. And this is as true for what we have been accustomed to call primary qualities as for the so-called secondary qualities. Science knows nothing about absolute properties.

The concept of energy as a universal generalization is a thin concept. But any predicate of the whole of reality must be thin. How convenient it would be if we could condense reality altogether into one formula, requiring no supplementary definitions, — matter, spirit, electricity, anything that could be substituted for the pluralistic variety of our world. But leaving *a priori* and sentimental preferences out, we must find what experience warrants us in saying in general about this variety. And the predicate of energy is at least more fruitful than the medieval, lexicographical predicate of being. It furnishes a methodological postulate without which science is impossible, and a program which can be filled out by scientific research. This methodological advantage of the concept of energy is stated clearly in Professor More's summary of Rankine, the founder of the science of energetics: "Instead of supposing the various physical phenomena to be constituted, in an occult way, of modifications of motion and force, he attempts to frame laws which shall embrace the properties common to any one class. He finds energy, or the capacity to effect changes, to be the common characteristic of the various states of matter to which the several branches of physics relate. If we then frame general laws regarding energy, we shall be able to apply them with appropriate changes to every branch of physics. In all cases we have a certain quantity of energy active in a definite manner. Our aim should be to find by experiment the properties of any such manifestation, and to combine all common properties by general mathematical laws."[1] This principle of Rankine can be extended, we believe, to the whole field of reality, including organic and psychic changes, however difficult it may be in the latter cases to formulate our results in exact mathematical terms. Wherever you have knowable entities, whatever their stuff may be, there you must have equivalencies in the way of predictable differences. Only in so far are they knowable. We must know reality by the differences which it makes to our practical conduct.

The Postulates of Energy Systems

Our energy systems are cross sections of reality in the service of our special purposes. They are pragmatic, but that does not mean that they are unreal. They are real just insofar as they are based upon genuine characteristics. In analyzing any such system there are certain general postulates holding for all systems: there must be certain variables, there must be the form or organizing relation of the system, and there must be recurrence. Recurrence is the pragmatic equivalent of what an older metaphysics spoke of as substance. We must now try to illustrate the working of these postulates in some typical energy systems.

In a mechanical system, such as that of ordinary kinetic energy, we have three independent variables: gravitation mass, space units, and temporal units. For purposes of social description, these variables must be standardized. We ascertain the gravitation mass at a certain location on the earth's surface, Paris for example. We standardize our space units in terms of some common measure, kept at a certain constant temperature, whether it be the steel yard in London or the meter in Paris. We standardize our temporal units in terms of sidereal time, and our clocks are so regulated. These units are constant for practical purposes, but they are at best pragmatic measures. The mass of the earth, sidereal time, and our conventional space measures are all undergoing variations, but so long as they serve our common purposes, we can ignore such variations. If all bodies in space varied correspondingly, owing to motion or electromagnetic action, we should not be able to detect it. But since the quantities measured and the measure would vary together, we should not be practically affected by this universal relativity. Furthermore, our simple mechanical system has form. It is uniquely determined by the three factors mentioned, *viz.* gravitation, space, and time units. It is statable in terms of a simple formula: $\frac{1}{2}MV^2$, where M stands for mass, and V for velocity. And, finally, while we live in a world of constant flux, and try to steer our behavior in such a flux, the system in question repeats itself in such a way that we can use the same formula again and again under the stated conditions.

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[1] *Hibbert Journal*, July, 1909, p. 785. The views of Rankine are to be found in a memoir read before the Philosophical Society of Glasgow in 1855.

In a more complex material system, such as a chemical system, we can analyze the system into the same elementary postulates. If we wish to explain the compound, water, for example, we must take account of the variables — the properties of hydrogen and oxygen, and of temperature. We state the organizing relation as H_2O, the combining proportion of hydrogen and oxygen. And once we have standardized the factors, we are able to repeat the formula so long as the conditions on our earth remain fairly uniform, *i.e.* for all practical purposes.

In analyzing electrical systems, we do not seem to be able to use gravitation mass as one of our variables. It seems to be empirically true that charging a metal bar with any amount of electricity does not alter its weight. But science has found other variables no less clear and definite. We know electrical energy, as we do mechanical, by the work it does. "The presence of an electric current is recognized by three qualities or powers: (1) by the production of a magnetic field, (2) in the case of conduction currents, by the production of heat in the conductor, and (3) if the conductor is an electrolyte and the current unidirectional, by the occurrence of chemical decomposition in it. An electric current may also be regarded as the result of a movement of electricity across each section of the current, and is then measured by the quantity conveyed per unit of time."[1]

In electrical energy, as in mechanical, we are able to apply our three postulates. We have certain variables, a certain form which is mathematically statable, and we have recurrence. "A current flows in a circuit by virtue of an electromotive force, and the numerical relation between the current and the electromotive force is determined by three qualities of the circuit called respectively, its resistance, inductance, and capacity."[2] In the case of continuous, unidirectional conduction currents, the resistance of the circuit is the only one of the above mentioned qualities of which we need to take account. The relation of electric motion to this is formulated as Ohm's law, "which states that the numerical value of the current is obtained as the quotient of the electromotive force by a certain constant of the circuit called its resistance, which is a function of the geometrical form of the circuit, of its nature, *i.e.* material, and of its temperature, but is independent of the electromotive force or current."[3] "We may otherwise define the resistance of a circuit by saying that it is that physical quality of it in virtue of which energy is dissipated as heat in the circuit when energy flows through it."[4] When we deal with alternating or periodic currents we have to take into account inductance as well as resistance. Inductance "may be defined as that quality in virtue of which energy is stored up in connection with the circuit in a magnetic form. It can be experimentally shown that a current cannot be created instantaneously in a circuit by any finite electromotive force, and that when once created, it cannot be annihilated instantaneously. The circuit possesses a quality analogous to the inertia of matter. If a current, i, is flowing in a circuit at any moment, the energy stored in connection with the circuit is measured by $\frac{1}{2}\,Li^2$, where L, the inductance of the current, is related to the current in the same manner as the quantity called the *mass* of a body is related to the velocity in the expression for the ordinary kinetic energy, *viz.* $\frac{1}{2}\,MV^2$. The rate at which this conserved energy varies with the current is called the 'electrokinetic momentum' of this circuit (= Li). Physically interpreted this quantity signifies the number of lines of magnetic flux due to the current itself which are self-linked with its own circuit."[1] In electrical energy, therefore, as in ordinary mechanical energy, we can define the variables involved in its activity, we can state its organizing relation in terms of simple mathematical formulæ, and we can predict the future for practical purposes under the stated conditions.

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[1] Article, "Electrokinetics," Encyclopædia Britannica, 11th ed., Vol. IX, p. 211.

[2] *Ibid.* p. 211. [3] *Ibid.* p. 211. [4] *Ibid.* p. 212.

If, again, we take an organic system, we find that we can deal with this on the basis of the same postulates. Here too we have our variables, our organizing relation, and recurrence. Life, complex as it is, is after all, a chemical compound. "Protoplasm, the living material, contains only a few elements, all of which are extremely common, and none of which is peculiar to it. These elements, however, form compounds characteristic of living substance and for the most part peculiar to it." Of such elements, the most significant is proteid, consisting of carbon, hydrogen, oxygen, nitrogen, and sulphur. Among other elements are such organic compounds as fats, carbohydrates, and various inorganic substances such as salts and water. "We attain, therefore, our first generalized description of life as the property, or peculiar quality of a substance composed of none but the more common elements, but of these elements grouped in various ways to form compounds ranging from proteid, the most complex of known substances, to the simplest salts. The living substance, moreover, has its mixture of elaborate and simple compounds associated in a fashion that is peculiar. . . . Life is not a sum of the qualities of the chemical elements contained in protoplasm, but a function first of the peculiar architecture of the mixture, and then of the higher complexity of the compounds contained in the mixture. The qualities of water are no sum of the qualities of hydrogen and oxygen, and still less can we expect to explain the qualities of life without regard to the immense complexity of the living substance."[2] It is true that the synthetic chemist has not been able to account for the origin of protoplasm by artificial manufacture from the known ingredients, but this, he feels, is due to the fact that he has not yet discovered the unique conditions of temperature, pressure, etc. which were present at the geologic origin of life. In any case his ignorance would not be helped by assuming another element such as vital impulse. Vitalism seems to be laboring under the confusion of trying to account for the unique organizing relation as a discrete element in the compound, which is like introducing a water impulse to account for the unique properties of water.

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[1] Article, "Electrokinetics," Encyclopædia Britannica, 11th ed., Vol. IX, p. 212.

[2] The quotations are from Dr. P. C. Mitchell's article, "Life," in Encyclopædia Britannica, 11th ed.

What impresses us about such an energy system as life is not so much the variables of composition, concentration, temperature, etc., as the architecture or organization. What baffles us when we try to characterize life is that the elementary properties we may enumerate may be found singly in other and simpler systems. Just as we cannot point out a unique element in the composition of life, so it is difficult to point out a unique property. Does living matter grow by intussusception as opposed to superficial addition? So do inorganic liquids, as when a soluble substance is added. Is living matter irritable? It is easy to find inorganic matter which is sensitive to specific stimulation. The camera film is far more sensitive than our eye; the resonator than the ear, etc. As regards instability, if we use Spencer's formula that "life is the continuous adjustment of internal relations to external relations," we can parallel the readjustments in the case of life with those of inorganic nature. In either case, the action of the stimulus is complicated by the organization of the system and its potential energy. As regards mobility, so far as that is characteristic of life, the Brownian movement is the very image of perpetual mobility, and was first mistaken for a living compound. So we might parallel simple reproduction by "the breaking up of a drop of mercury into a number of droplets." Cumulative disposition and differential action on the basis of it can be paralleled in the inorganic world. Nor are discriminative selection and reaction upon a type peculiarities of the organic world. And, finally, the inorganic world acts in accordance with the principles of logic and mathematics, even though it may not be conscious of so doing. If you take the whole range of organic action, therefore, you could doubtless parallel the various properties and functions in the inorganic world. In the large, too, the latter reveals such selective adaptation and compensation in its moving equilibrium as would require an "omniscient demon" to establish. The uniqueness of life lies in the fact, long ago pointed out by Fechner, that life in its evolution brings together and correlates, into one unique ensemble, a vast array of properties, which are scattered in nature. This ensemble has unique properties of its own, new ways of storing potential energy, and new modes of behavior. No theory of the origin of life or its relation to antecedent evolutionary stages can affect the uniqueness of the system itself. Nor must we regard its spontaneous or uncertain character, for our limited powers of prediction, as a peculiar merit. For, in the first place, this is due largely to our ignorance; in the second place, we value conduct because it is dependable as well as because it is novel. We prefer people who are invariably truthful, honest, just, and kind to those who are liable to do anything whatsoever.

If we, finally, take up the most complex type of energetic system with which we are familiar, *viz.* that of social interactions, we must here too apply the same postulates. We must discover the variables, the organizing relation, and the type of recurrence which we can predicate. We can abstract, for the purpose, from the material conditions, such as geographical configuration, temperature, water supply, character of the soil, etc., as well as from the organic conditions which form the background of the race, and deal with a social system as a closed system, as we have done in the other types. We may find analogies from the more elementary systems useful here. Sir Joseph Larmor, in speaking of a material system, says: "The amount of energy, defined in this sense by convertibility with mechanical work, which is contained in a material system, must be a function of its physical state and chemical constitution and its temperature."[1] Translating these categories into terms of society, we may say that the variables in a social system are the group conditions in the way of greater or less condensation of numbers, the mental constitution of the factors involved, and the common emotional excitement. Durkheim has oversimplified the problem when he tries to account for society in terms of volume (or number) and density, the definition of material mass. These have indeed their appropriateness. We find that volume is a variable involved in social conduct. The volume of suggestion makes it more effective. The number engaged in the action affects the conduct of the participants in an altered sense of responsibility and in the checks and releases that obtain. We find, too, that density or proximity has its corresponding effect. It gives a peculiar reality and vividness to the relation, which is particularly marked in crowd action. But these variables, if used in any limited sense, are not the only ones. To understand the psychic state or inertia, we must take account of the peculiar equilibrium at the time, within the group in which we wish to produce effects. This may be a static equilibrium in the way of habits and traditions, or a moving equilibrium in the way of certain tendencies which the group is striving to realize. In each case the sort of equilibrium that exists conditions our action. Timeliness of suggestion is important if we would accomplish results. In an equilibrium moving in the opposite direction from our intent, we may find that hitting it laterally, or by indirect suggestion, encounters less inertia than hitting it head on. Again, as regards constitution, we find that we must take account of the individual characteristics of the components in the way of inherited and derived tendencies. The mental constitution conditions the type of action which we can expect. We must know our people, their race traits of instinct and temperament, and their psychological tendencies of needs, ambitions, and aversions. This is quite as necessary as knowing the elements which enter into the chemical compound. In either case, if we fail to take account of the reactive properties of our elements, we may find ourselves unwilling participants in an explosion. We must try to discover, too, the amount of emotional excitement which is necessary for the specific reaction to take place. Social compounds have their boiling point and freezing point, their point of solvency and crystallization, as truly as chemical elements. We must find what degree of affirmation or passion will precipitate the special type of reaction. As in the case of dynamite, the instability of the structure may make the effect out of all proportion to the releasing stimulus. Witness the present war of the European nations.

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[1] Article on "Energetics," Encyclopædia Britannica, 11th ed.

To understand a social kinetic system we must take account of the organizing relation, as well as the variables of its constitution. We must find the thought form, the ruling passion, the dominant purpose, which makes the tendencies converge in one direction, be the interaction between individuals within the group, between the individual and the group or between groups. Sometimes lust for power, sometimes love of wealth, sometimes self-preservation, sometimes racial prejudice, sometimes loyalty to truth and right form the organizing bond. But always there is a striving for unity and simplification, for a new equilibrium, and this gives direction to the struggling motives. And as in physical systems, the movement is direct or in a straight line, except as there are interferences to overcome or go around, so in the social system. In the end, ideal unities are the only ones which can succeed in giving an adequate and durable direction to the various claims. Unified action must be reasonable action.

In social systems, as in simpler systems, there must be such recurrence of traits and situations as makes prediction possible. The difference lies in the enormous complexity of the social situation. By means of statistics, we can, to a certain extent, eke out individual observation; and in regard to some types of reactions such as marriages, births, suicides, etc., our curves are fairly constant; or, at any rate, the deviations are clear. For understanding the deeper motives and effects of human conduct, we need historic perspective. But here, as in the simpler systems, the facts have their own perspective of which we must take account, relative though our interpretation must necessarily be, in virtue of the fact that history is potentially infinite and that interpretation is of the very essence of the creative human process.

In analyzing energy systems we have selected our illustrations from the kinetic state of energy. This is due partly to the fact that we found this procedure simpler, but more to the fact that this state of energy is more significant for metaphysical purposes. The potential state, that of position or configuration, derives its significance from the moving state. By potential, we mean what energy *can* do when certain conditions are supplied which are different from those obtaining. Thus, to pass from energy of position to the kinetic state, there must, somehow, be unequal distribution of energy. In the case of falling bodies, we have unequal distribution of gravitational energy. Thermodynamics is built on the unequal distribution of heat. In the case of electrical energy, "if any cause operates to add or remove electrons at one point, there is an immediate diffusion of electrons to reëstablish equilibrium, and this electronic movement constitutes an electric current. This hypothesis explains the reason for the identity between the laws of diffusion of matter, of heat, and of electricity. Electromotive force is then any cause making, or tending to make, an inequality of electronic density in conductors, and may arise from differences in temperature, *i.e.* thermo-electromotive force, or from chemical action when part of the circuit is an electrolytic conductor, or from the movement of lines of electromagnetic force across the conductor."[1] In the case of social systems, it would be a case of the unequal distribution of emotional-volitional excitement.

In the potential state, energy is just as real as in the kinetic state, but is balanced or in equilibrium for the time being. In the case of a building supported on pillars, the energy of the pillars balances, for the time being, the gravitational energy. In the case of human actions, certain tendencies to action are balanced for the time being by inhibitions. A man would steal, but he is afraid of the police. In either case, when the balancing energy is withdrawn, we have an unequal distribution, and the persistent tendency becomes kinetic energy.

The term potential, however, is sometimes used when we contrast expectancies under one set of kinetic conditions with those under another set. Certain electric vibrations can become sensations of light to us when they act upon a photochemic retina; and certain air vibrations can become sensations of sound when they strike our ear and are transmitted to our cortical centers. Here the contrast is not between energy of configuration and energy of motion, but between what happens in the case of different reagents. In any case, the properties which are observed in certain contexts cannot be said to preexist independent of the contexts as was supposed by Anaxagoras, for example. According to him, the fruit of Demeter which we eat, and the water which we drink must contain the germs of blood and tissue and bone and hair which they serve to build up. The reason that things can produce such different results in different combinations is that everything contains a portion of everything. It is only the proportion of the properties which varies, and which determines the character of the particular thing. If pain is present in stimuli of a great intensity, then it must be a latent property at any intensity. But potential is not a category of the actual world, but of our social expectancy. The chicken is not present in the fresh egg at all. It would be nauseating to think so. Knowing that certain properties appear in certain energy systems, we can predict that they will recur when the conditions are repeated, but they are only real within the system.

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[1] Article on "Electrokinetics," Encyclopædia Britannica, 11th ed.

Potential energy, therefore, is not to be regarded as a distinct type, to be set over against such types as material and electrical systems. It is rather a set of expectancies which we may have in regard to any type when we contrast one condition with other conditions. We may contrast the condition of balance or equilibrium with work done when the special type of energy exists in a kinetic state; or we may contrast the work done under one set of kinetic conditions with that done under another set. Nature obviously does not know the word potential. It is a contrast which is contributed by our mind. In reality each reactive relation is uniquely determined, — in the case of material systems, by such characteristics as the physical state, chemical composition, and temperature, by geometrical pattern and direction, by cumulative numerical values, and by distance. Potential is not a characteristic which figures in the determinations of a system. The tendency to read our expectancies into reality as though they existed prior to and independent of the dynamic situation is only another instance of the pathetic fallacy.

Some Empirical Laws of Energy

We have dealt so far with different types of energy systems and the factors which determine such systems. While each type of system must be taken as unique and its specific characteristics observed, there are some characteristics which seem to hold for all systems of energy. Beside the general postulates of variable, form, and recurrence which hold for all systems, there are certain empirical postulates which pertain to energy systems in particular. These general characteristics are sometimes called laws, though this is somewhat of a misnomer since they have only been verified for some limited systems. One of these is the law of conservation of energy and closely associated with this is the conservation of mass. The law of conservation of energy has definite meaning when we deal with special energy systems. In a material system, for example, it signifies that when a certain amount of energy disappears as motion, it reappears as heat; and the quantity of heat is equivalent to the lost motion, though from the point of view of available energy it is only in part convertible into motion. It is equally easy to show the meaning of the law in the case of an electrical system of energy. Energy which disappears as electricity is found to reappear in the equivalencies of mechanical motion, chemical decomposition, or heat. In organic and social systems it is difficult to ascertain exact equivalencies in the complexity of changes involved. But here, too, we can in part, at any rate, note such equivalencies. In fact it was in connection with the potentials of foodstuffs in their relation to physiological activity, that Mayer first suggested the law, which was afterwards tested for material and electrical energies by Joule. It is clear that in organic and mental work there is a relation between nourishment and work done; there is also an equivalent in the way of heat as energy is used up. The heat of the skull, in the case of mental activity, is found to increase, and can be measured, though that of course is only one of the equivalents of mental work. Here as in mechanical energy, we must take account of the going on of the impulse itself and its effects in kind, which it would not seem possible to measure in an exact way. When you try to state the law of conservation of energy as true of all systems, Poincaré is quite right that it is necessarily vague. It signifies that there is some sort of constancy, that there are equivalencies, but it furnishes no definite content. Even so, however, it has more meaning than the old barren formula of identity in difference.

The law of conservation of mass or inertia is similarly empirical. It has been verified for some of the simpler systems of energy. Gravitational mass can be taken as practically constant at a certain point of the earth's surface. In the case of electrical mass we can measure the inertia of the current or electromagnetic field. In the more complex forms of energy, such as the organic and social systems, we are equally aware of the reality of inertia, and must deal with it, though we have no exact way of measuring it. We know, in any case, that inertia varies with motion. A moving body presents a different inertia from a body at rest. In the case of high velocities, approximating the velocity of light, there is a sudden increase of mass. Mass also varies with direction. A body in motion presents greater inertia to a body moving in the opposite direction than to a lateral impulse. This is equally true of the inertia of material bodies, of electric currents, and of social inertia. The constancy of mass in any case is a pragmatic affair.

Another characteristic, which seems to be practically general so far as our observation is able to go, has been called the law of degradation of energy. There is a tendency for energy to move from a higher to a lower potential. Since activity depends upon an unequal distribution of potentials, there would seem to be a tendency for the available energy to decrease, and for the universe to run down. This is particularly noticeable in connection with the constant tendency for a certain amount of energy to be dissipated as heat which can only in part be made available; but it holds wherever there are uncompensated expenditures of energy. This law does not contradict the law of conservation of energy since the sum total of energy would still remain constant, even if all available energy were diffused into random molecular motions, such as we observe in the Brownian movement. While the degradation of energy seems to be inevitable, from the point of view of our limited survey and control, it cannot be regarded as an ultimate law of the universe. The Greeks with inferior tools, but a superior imagination, realized this. In the words of Empedocles: "For if they (the elements) have been passing away continually, they would not be now."[1] Maxwell showed that an omniscient demon, by sorting all the greater velocities on one side of an imaginary partition, and all the lesser velocities on the other side, could create new available energy. "This shows that the principle of the dissipation of energy has control over the actions of those agents only, whose faculties are too gross to enable them to grapple individually with the minute portions of matter which are the seat of energy."[2] If the universe is infinite in time, there must be some compensating agency corresponding to Maxwell's omniscient demon which keeps the universe wound up. It remains true, nevertheless, that for our practical purposes energy systems are in part, at any rate, irreversible.

Any postulate, which is based on a one way process, — such as the law of equilibrium, the law of least stress, Spencer's law of evolution as a passing from homogeneity to heterogeneity, with a corresponding dissipation of motion, — can only have significance for limited systems within our experience. If we apply them to reality in its wholeness, without compensation, they imply a finite beginning and end of our world. In an infinite past, any one way process of finite changes must have run its course innumerable ages ago.

Another characteristic which seems to be universal is that of rhythm. We have long been familiar with the rhythmic character of some of the large movements that give us the periodicity which is the basis of our time measurements, whether in the rhythmic functions of the organism or of our astronomic system. We have observed, too, the rhythm in the evolution of life forms where periods of stability seem to alternate with periods of mutation; and we are familiar with a similar rhythm in the social history of the race. It is only recently, however, that Planck's theory of quanta has called our attention to the same rhythmic character in the more minute and simpler systems of energy where we seem to observe the systole and diastole of nature's heart. Energy seems to proceed by finite drops rather than by continuous and infinitesimal gradations. Moments of potential and active energy alternate. It is also discontinuous as regards the quantitative conditions of its activity. Effects of a characteristic kind take place only when a certain threshold of inertia has been overcome. This is illustrated in the physiological realm by Weber's law, which formulates the fact that certain differences in sensation can be perceived only when the stimulus is increased by a definite ratio of the previous amount.

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[1] Burnet's translation, line 90.

[2] Encyclopædia Britannica, 11th ed., article, "Energy."

We have seen that relativity is a fundamental characteristic of energy systems. Properties vary with the system. We can speak of no properties in the abstract. Our standards of measurement are subject to variation no less than the things measured. For practical purposes, we standardize our units of measurement by making the conditions as stable as we can. But at best the conditions of which we can take account are limited. If our standards and the things to be measured vary alike with reference to conditions outside of our observation, we are necessarily ignorant of such variations, and for practical purposes they do not concern us. But theoretically the thought is uncanny and disquieting. We know of no absolute position in space or absolute system of relations. Motion is for us relative to a limited system of positions which we have selected for provisional purposes. Our generalizations, whether of facts or values, are circumscribed by the relative systems of our experience. Our standards of measurement, whether of energy, time, or space, are all alike pragmatic. They are conveniences within the particular conditions with which we happen to deal. And so long as we can find our way and perform our common tasks on the basis of them, they are practically valid. This does not mean absolute agnosticism, since such properties as we experience, and such relative relations as we can observe, must be real in any case, however fragmentary they may be, and however much more intelligible they might become in more comprehensive systems. Nor does relativity mean neutralism. It is only our intellectual abstractions that are neutral. Things for us must be known as ensembles of properties within energy systems. As such, they do real work. When we speak of activity as the common characteristic of all our real systems, it is not the abstract concept of activity which does work, but activity as uniquely determined within the special system with its movement and form. Neutralism is the emasculated ghost of the old superstition of abstract, independent entities, — the grin without the old metaphysical cat of inert substance, but none the less reminiscent of that beast. Not even mathematical entities have any meaning except as predicative functions within a system, though here the system is analytic, determined purely by our assumed initial postulates. Energetic systems are empirical. Their properties must be discovered *a posteriori*.

The Relation of Energy Systems to One Another

It is the custom of science to deal with systems of energy as closed systems. We have seen, however, that certain characteristics overlap and seem to hold for all energy systems. The question naturally arises as to the relation of these systems to one another. Can we find a common denominator? Science deals with special systems and their characteristics. The transition from one system to another — from gases to liquids and solids, from the chemical elements to their compounds, from material systems to electrical and mental systems, with the unique ensemble of properties in each case — science takes as a matter of fact. It recognizes the discontinuities in nature as well as the continuities. Whether we are concerned with conditions that are under our control, as in the production of the compound, water, from hydrogen and oxygen in the chemical laboratory, or with conditions antecedent to our experience by vast geologic ages, and still unknown to us, as in the case of the compound, life, science accepts new beginnings as facts, and observes and catalogues the characteristics of the new system as best it can.

Philosophy cannot know more than science about matters with which science deals. It has no business to stick to inert substance when science has found the conception of energy the more fruitful one. It has no right to pass upon the facts or theories of science so far as these are based on experience, and found serviceable in meeting our practical problems. But it is the province of philosophy to try to understand science by correlating its results with each other, and with the permanent demands of the race.

It would seem, in the first place, that creative synthesis is of the very nature of reality. We must accept the new qualities and values as gifts, whether it be the compounding of mechanical forces in a new direction, or the properties of chemical compounds, or a new life unity, or a new social bond. In each case, we must take account of the properties unique to the specific situation, as well as observe the persisting constants. In each case, we must follow the lead of experience, and shape our theories accordingly. Each energy system with its properties must be taken as real. It has just such properties and relations as are manifest in the system, whether they be the simpler properties of material systems, or the more complex properties of such systems as life and mind. There is nothing occult about energy, except as our ignorance makes it so.

In the second place, systems of energy, as we find them in the real world, overlap. There are no closed systems except for our abstract purposes of description. They make definite differences to each other. They interpenetrate and interlock into one energetic world. Energies, throughout the complexities of systems, retain their primal property of doing work. They are ever expended into other energies and reimbursed from them in the great clearing house of nature. The cleavages are of our own making. They are due to our assumptions, not to reality. When, for example, science held to the hypothesis of inert substances, acting on each other by impact — inert, extended, material substances and inert, non-extended, mental substances — as its working model of reality, it was difficult to see how material energy could in any way make a difference to mental. It would be equally difficult to see how it could make any difference to electrical systems, where likewise molecular models do not seem to apply. In either case, we should have to invoke parallelism with its absurd results to bolster up our initial assumptions. But our intellectual models cannot alter the facts. The real units of reality, we have seen, are not inert entities, but energy systems, in one type of which material properties constitute a differential characteristic. The energetic conception of reality leaves us free to follow the lead of the facts, and to recognize such continuities and discontinuities, such uniqueness and interdependence as we find. Electricity gives rise to mechanical and chemical changes; and they, in turn, serve to liberate electricity; and while the latter is more subtile and pervasive, it is the material world which canalizes our electrical energies and makes them serviceable. Plant life is dependent upon the material systems for nutriment and framework, and upon light and heat for the processes of assimilation and growth. The mental type of system leans upon the material and organic systems. It requires proper nutriment, proper conditions of temperature and light, proper bodily position, proper rhythms of rest, in order to do its work, not to mention its dependence upon neural structure. It is clear that it is the more complex systems that overlap and are correspondingly dependent upon simpler systems. Heat would seem to be the lowest and most amorphous type of energy from our point of view, as the more complex energies seem to be dissipated as heat, and thus seemingly lost as available energy. But as we have already pointed out, this can hold only for our limited perspective and powers of control.

Reality reveals itself in many systems. It is matter, it is light, it is electricity, it is mind, it is truth, right, and beauty. It is all of these and many others. All the varying phases belong to it, and one is no more real than the other. It is "day and night, winter and summer, war and peace, satiety and hunger; but it takes various shapes, just as fire, when it is mingled with different incenses, is named according to the savor of each."[1] The more complex systems furnish a greater variety of properties, but however imposing they may be, they must trail along and draw their sustenance from the simpler, even as the ivy trails along and draws its sustenance from the soil. While the more complex systems logically overlap the simpler, which they presuppose as conditions and instruments, this does not mean that the simpler have no existence of their own, but are always dissolved or taken up into the more complex. When they

[1] Adaptation of Heraclitus, fr. 36, Burnet's translation.

are so taken up, they cease to exist as simpler. Water, as an individual compound, has definite, characteristic properties; while water, taken up into other compounds, inorganic and organic, is no longer water. It has lost its individuality. But the water that satisfies thirst, with many other unique properties, has claims of its own. We do not want it merely abrogated into more complex systems. We would not want to drink water that has entered as a constituent into blood, or let the children play with water that has been taken up into nitroglycerine. In the economy of the whole, one system cannot be said to be more necessary or real than the rest. Here, at any rate, the words of Browning hold:

> "* * * Nor soul helps flesh
> More now, than flesh helps soul."

Of each, we must say, in characterizing reality: "That art thou." There is no substrate except the interlocking, interdependent energies; no unity, except the form of each, and of the multicolored whole.

The passion for simplicity, however, is incurably rooted in the human mind, and there will always be the attempt to reduce the concrete variety of the world into some primordial system, be it matter, electricity, or mind. This seems a mistaken and fruitless quest. We must adhere to the pragmatic postulate without which we could not proceed at all, *viz.* that reality is what it manifests itself to be in its varying contexts. The process is fundamentally a creative process. It is not a shuffling of neutral entities. The properties are combining properties; they are uniquely determined by the system. We have no right to dogmatize, whether in reading backward from the more complex systems to the simpler ones, or forward from the simpler to the more complex. We must find our way on the basis of experience and take reality as it exists at each stage of complexity.

We can, indeed, classify systems on the basis of common and differential traits; and we find that some can be treated as varieties of one species. Thus it has been found that electricity, light, radiant heat, and magnetism can be successfully dealt with on the basis of a common electronic theory, though their differentia are no less significant than before. It has been suggested that nervous energy may be reduced to the electrical type. Says Professor Gotch: "Physiology has definite grounds for believing that, as far as present knowledge goes, both the production and cessation of central nervous discharges are the expression of propagated changes, and that these changes reveal themselves as physico-chemical changes of an electrolytic character. The nervous process, which rightly seems to us so recondite, does not, in the light of this conception, owe its physiological mystery to a new form of energy, but to a circumstance that a mode of energy displayed in the non-living world occurs in colloidal electrolytic structures of great chemical complexity." While science thus seems to have succeeded in simplifying large domains of facts, so long seemingly heterogeneous, it has also discovered new varieties and complexities which challenge further reduction and corresponding overhauling of old categories, as in the case of radioactive energies. For pragmatic purposes, three general types of systems would seem to stand out — the material type of system with its differentia of gravitational mass and molecular motion; the electrical type of system with the electron as its energy unit; and the mental type of system where conative tendency, with its possibilities of consciously directed action, cognition, and appreciation, is fundamental. But such a classification is purely a matter of convenience, and throws no light upon the process itself.

We seem to get more light when we take the evolutionary point of view. No doubt our systems of energy, as we observe them to-day, are the result of a long process of selection and survival. Darwin showed this in a classic way for the organic type of system. It is equally clear for the more complex mental systems, on the basis of which we must understand human history. Nor does the inorganic world lie outside this evolutionary conception. The properties of matter, the distribution and concentration of the elements, and the stability of the present material structure — these are all the result of a selective survival process. It does not seem probable that this marvelous adaptation of the material system to telescope into and form a fit environment for more complex systems such as life, can be accounted for on the basis of mere chance.[1] It is "more congenial" to our mind, to use Poincaré's phrase, to assume intelligent selection within the process, however much such selection may surpass our faculties. That systems exist at all — relationships of processes statable in terms of a few simple principles — would seem in itself, as Newton long ago pointed out, an indication of rational emphasis within the world of which our reason is a part.

While the empirical generalizations about evolution must always have significance for our reading of reality, their metaphysical interpretation is often confused. Here the mechanical tendency of the human mind has come in to vitiate the reading. While we can trace a sequence from simpler to more complex systems, within a given series, we cannot say, therefore, that the properties of the more complex systems are compounded out of the properties of the simpler ones. If complex life-systems have evolved from unicellular organisms, it does not follow that they are a mere mechanical combination of the simpler organisms. New properties have been developed as a result of the organization, differentiation, and selection within the process, in its adaptation to a larger environment. These properties must be taken for what they are in each stage of development.

Owing to the early progress, as well as to the convenience, of mechanical science, it was natural that material systems should come to be emphasized as the essential type of reality, and that the more complex systems should be regarded as compounded out of material properties. But while we must recognize material properties as real within the systems where we find them, we have no reason to regard them as any more real than the unique properties or ensembles of properties which appear in more complex systems, such as life and mind. Even if the material type of system were absolutely earlier, it would not follow that it is more real. As a matter of fact, the material type of system is just as much an evolution as the organic type. And while, in our limited series of geological evolution, the material system had to evolve to a certain stage before life forms could appear, the two types of systems have for long ages evolved together and a corresponding fitness been established. Nor does it follow from the temporal antecedence of the material properties that they could give rise to the properties of the more complex systems, or that the material properties are of greater importance in understanding reality. The real energies which we deal with in evolution have other potentialities than material properties; and it is these potentialities that come to light in the creative process of the universe. It is not the properties of extension, weight, cohesiveness, etc., which constitute life, though they are present, and form an important index to our description of life processes. Life is characterized by the ensemble of properties which is unique to its own system and which cannot be said to exist at all in material systems. The properties of the simple systems must be treated as instrumental when we deal with the more complex systems. They are, as it were, handles or signs, by means of which we can lay hold of and, to a certain extent, describe and control the conditions of the more complex systems. Thus we are able to produce a chemical compound with its new properties, once we know the constituent elements and the proper conditions of temperature, etc. Thus the great nature chemist was able to produce, through the energies of a seemingly dead world, the properties of life; but the deadness exists only in our intellectualistic misconceptions. To try to account for life as a compound of material properties is as reasonable as to try to account for the characteristic thinking of a man on the basis of his size and weight. These are indeed important for certain kinds of behavior of human beings — getting a suit of clothes for example — but they do not as such account for their thinking.

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[1] See in this connection "The Fitness of the Environment," by Professor Lawrence Henderson.

The electrical theory is subject to the same criticism as the old material atomism. We cannot account for matter as a mere arithmetic sum of negative electric charges any more than we can account for life as a sum of material properties. The material atom is, on any theory, a unique system with its own combining relations with other atoms, its own unique properties, which are not the properties of free electrons; and adding an unknown element of positive electricity does not clarify the situation, any more than adding vital impulse to a material system explains life. Whether such an element is proved to exist or not, we should still have to take account of the concrete system of matter itself with its concentration, pattern, durability, and reactive properties. On any theory, the material system is uniquely real; and we must take the characteristics as they exist in the system itself. There is indeed an interesting analogy, as pointed out by J. J. Thomson and others, between the figures assumed by magnets in an electrodynamic field and the periodic law of the elements. But mathematical laws sometimes hold for decidedly disparate systems. Witness the formula for kinetic energy. The different conductivity of different elements would not prove, any more than disprove, an electrical substrate. A man carrying a log is not necessarily a log. Even if the characteristic properties of matter, such as extension and weight, can be simplified for purposes of description by being stated in terms of motion and distance, or if the material atom can be regarded for certain purposes as a halfway house for treating facts which are further dissociable into electric charges with their particular and constellation velocities, it still remains true that extension and weight are practical determinants which matter does possess, and which electric charges, as we ordinarily understand them, do not possess.

To try, again, to account for matter as mind, — "degraded" or "estranged" mind, "mind hide-bound with habit," — is at best a confusing use of language. Material systems do *not* have the properties of mental systems. They are as unique as the latter and have their own claims to reality. They are not dignified one whit by being associated with the name of mind. There is no reason, moreover, for using opprobrious epithets about matter. It has its own place and importance in the economy of reality. It is the unique distribution, concentration, and durability of the material world which makes possible the more complex systems of life and mind. Through the correlative evolution of matter, reality makes possible that other series of evolution which terminates in significant and appreciative reactions to the world. The material and vegetative systems furnish the stored-up energy, the stable frame, the means of canalization of the more subtile energies. They furnish the tools, — direct in our bodily movements, indirect in the case of material instruments, — which make intelligent behavior possible.

There is one sense in which we can speak of the more complex systems as higher and more real. They reveal more fully the potencies, the actuality of the world of energies in which we live and move and have our being. They overlap logically. They imply the simpler systems, such as the material and electrical, as their background and instruments. They indicate, in a more concrete way, the direction, the formal organization of the larger world, the system of systems, from which our fragmentary systems are abstractions. It is because this system of systems, with its potencies and form, interpenetrates the humblest parts of the universe, and gives direction to the whole, that it seems as though the simpler systems produced the more complex. But what we call "matter" is more than matter. The seemingly inert energies of our world are fraught with infinite potentialities as they enter into the more and more complex systems, and yield up the for-us hidden properties, in the stress of heat, in electrolysis, in organic assimilation, in the emotional excitement of mind associations. We may well say with Browning:

> "Well, this cold clay clod was man's heart:
> Crumble it, and what comes next? Is it God?"

In the case of one system, the various systems do indeed converge into one unique relation so far as we are concerned. And that is in the cognitive system. It is mere tautology to say that for us to speak of energies they must first be known. In so far as known, they are indeed uniquely determined by the cognitive relation. But it is a false assumption to suppose that our *knowing* the forms and properties of systems constitutes their existence. We can know the systems *because* they exist and have a certain form and certain properties. This is as true of our own past as of the Milky Way. Our taking account of them is an afterthought. It does not alter the unique systems of which we take account. The stellar system, the properties of our material environment, the reactive properties of plants, the civilization of Greece, existed — they had their own properties and form — long before we took account of them. Hence, we can abstract from our personal perspectives and socialize them. We socialize our space orientation, which in the first instance depends upon the organism and its needs. To make intelligible our fleeting perceptions, we interpolate our gravitational and electrical systems. We discover their properties and mathematical form. In mental systems, we have again a unique reality which we must try to understand. Only in such systems is the ensemble of properties known as values possible. These systems are indisputably real when they exist, and are irreducible to other systems. They are "the master light of all our seeing."

In these conscious mental continuities, reality reveals to us, not only the formal relations which we discover and retrace as truth, but the demand for justice, the property to have mercy, the response of beauty. This is true not only in our human relations, but still more in those higher continuities which we call communion with God. These higher contexts must be taken to reveal the nature of reality, quite as truly as the simpler contexts which we deal with in mechanics. Each system makes its own unique creative contribution; each system furnishes a solution in which reality shows more of its reactive properties. Thus electrical systems reveal properties which lie outside our material systems. In the chemistry of the organic systems, we find marvelous powers of assimilation and response, which, so far, lie beyond our artificial imitation. In our mental systems, with their greater capacity for storing up potential energy in the way of inhibitions and facilitations of behavior, this complexity of properties increases still more. It is here that the unique responses of value arise as creative additions to our world. These are as much a part of the reality of the world as the chemical responses. They constitute for us its choicest part. The universe, in its varying systems of creativeness, calls to our mind the Chinese swallow which gives us our edible nests. First it produces a nest of largely external material and contributes but little of its substance to the frame. In its second building, after being deprived of its first nest, it labors harder and secretes more of itself. In the third nest, in the pain and anxiety of frustration, it yields up its very lifeblood and colors the nest with its crimson. So in the rare solutions of our intense emotional excitement, the energy of the universe, in the pain and stress of clashing interests and the threatened defeat of its ideal instincts, contributes its very soul as it labors to give birth to new values, and colors the gray world of matter with its rainbow glory. Here the systems of the universe not only exist but have significance.

And who shall say that our limited mental systems are the last word of reality's revelation? The energy which shows its marvelous properties in all these systems and which, even in the simplest, reveals a sublimity which humbles our power and insight, may well be capable of higher creative syntheses, more comprehensive actualities and insights than those associated with our organisms and our social institutions. That such a synthesis is real, we have an intimation in the vast correlative adjustments of nature of which we get glimpses in science, and in those instinctive demands for harmony and beauty which make themselves but feebly felt in us. We can see and appreciate but piecemeal and in the dark glass of our prejudices. The directive power of the universe of which we have intimations in our higher continuities no doubt has a more adequate way. In the meantime we must have faith in our own insight, relative though it be.

In this brief survey of energy, we have implied throughout other categories than energy properties. Only so could we understand energy in action or as doing work. Otherwise it would be congealed, — frozen energy. We have implied geometrical properties and time properties which must figure in energy systems. We have also implied form, without which energy systems would be unstatable. Elsewhere we have given more adequate consideration to these characteristics. We must here turn to a further analysis of energy properties, as they appear in the world of things and minds.

CHAPTER IV

Do Things Exist?

At first sight nothing could seem more obvious than that things, individual blocks, exist. In fact, that *things* exist as individual and distinct has seemed far clearer to common sense than that *minds* are individual. We have only to recollect that Aristotle found mind (active *nous*) impersonal and universal, while the body, with the functions depending upon it, seemed to furnish the individual substrate, and that Thomas Aquinas made the body the principle of individuation, without which human souls, like the angels, would merge into the genus. It is unnecessary to say that philosophy has changed front in this respect, and finds it comparatively easy to recognize the individuality of minds, while the independence and individuality of things has well-nigh disappeared in the general continuum.

The Antipathy to Things

There have been several motives for this attitude towards the reality of things. It is hardly necessary to mention that of temperamental mysticism, which will always seek reality in haziness and away from distinctions. Our going into a trance or going to sleep does obliterate plurality so far as we are concerned. But while it does away with the *significance* of distinctions for the dreamer, does it also do away with the *existence* of distinctions? I do not believe so. I cannot help feeling that we are wiser when we are awake than when we are asleep, and that reality is such as we must take it in our systematic conduct. I would rather trust the tried-out distinctions of common sense and science than the dreamy confluence of mysticism.

Our antipathy to distinctions, however, may not be due merely to temperamental laziness. It may be due to conceptual difficulties. Thus the difficulties of conceiving plural things and their interactions in space lead Lotze to conceive the universe as a polyphonic unity — an "æsthetic unity of purpose in the world which, as in some work of art, combines with convincing justice things which in their isolation would seem incoherent and scarcely to stand in any relation to one another at all."[1] Bradley, in a similar way, having found the problem of relations and of motion insuperable on his abstract basis of procedure, has recourse to an æsthetic absolute where the plurality of things and their ceaseless struggle is at rest. I cannot see, however, how we are justified in reading plurality out of the world because its existence interferes with our ready-made concepts. New concepts, perhaps the electrical definition of physical atoms, may make it easier to see how a world of relatively stable things may coexist and interact. In the meantime, if we must acknowledge diversity of things for purposes of conduct, we must hold that they have some distinct reality, even while we are perfecting our conceptual models. In any case, thought must wait upon facts. Where we find symphonic unity of system, there we must of course acknowledge it. But when the facts do not warrant such intimate unity, we have no right to read it into them on the basis of *a priori* conceptions. Even within our own individual history, we are far from finding a closely woven purposive unity. We are the creatures largely of habit and instinct. We must provisionally acknowledge different types of continuity of which unity of purpose is only one.

The intellectualist's condemnation of things owes its convincingness to certain deep-rooted prejudices. One of these prejudices is that individuality means indivisibility, and conversely that what can be divided into parts cannot be individual. The substance of Spinoza and the atoms of Democritus are alike indivisible. This difficulty of indecomposability would of course equally influence our view of psychic unities. We would have to deny the reality of the self, because it is complex and capable of analysis. The art object would fall to pieces the moment we analyzed it. Hence you have either a heap of pieces on the one hand or a mystical, undifferentiated unity on the other. Now, what we must do here is to face the problem honestly and cast out prejudice. We can, as a matter of fact, recognize a self or a work of art as a unity, if the complexity converges in a direction or towards a purpose. If in the organic or inorganic thing we can recognize a common impulse or movement, we must recognize the thing as one, even though it is complex and physically divisible.

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[1] "Metaphysics," English translation, Vol. II, p. 60.

This prejudice is closely connected with another — the vice of abstraction, useful though abstraction is in its own place in the economy of thought. This prejudice consists in emphasizing the disjunctive function of the mind and in ignoring the conjunctive. Thus it is regarded as self-evident that the disparate qualities — the creatures of linguistic substantiation — exist; but their interpenetration, their coexistence in the one thing, is regarded as the insuperable problem. And it is insuperable, if you take the disparate abstractions for granted and try to compound a thing out of them. But this is starting at the wrong end of the process. We must go back to the concrete object. While our thought can abstract qualities, these qualities do not exist first as abstract entities and then compound themselves. They are ways of taking things in concrete contexts. If we can discriminate distinctions within the object, it is quite true that we must regard such distinctions as real. But if we must take the distinctions as coexisting, interpenetrating, flowing into each other, cohering in one pattern and movement, it is also true that they can so interpenetrate and coexist. Our conjunctive way of taking the object of experience needs no more justification than our disjunctive or analytic way. If the distinctions *do* coexist and interpenetrate, they *can* do so. We do not make the transitions or unities, any more than the discreteness, in taking account of them. And Berkeley is quite right in maintaining that no additional entity, no substance, or x, can simplify the fact, which is given with the qualities, *viz.* that they interpenetrate and persist. To trace these coexistences and transitions of the facts of experience is the business of science, quite as much as that of the analysis of properties.

It is strange that the unity of the thing should have caused so much trouble, while most philosophers have been willing to take the diversity within the thing for granted. I cannot see why one is not as mysterious or as clear as the other. If you assume that a thing is mere abstract unity, it is true that no logic could get diversity out of it. If, again, you start with a collection of independent, disparate qualities, it will no doubt be impossible to get any unity into it. The simpler way is to proceed empirically and not to make absurd assumptions. If we can distinguish diversity of function, then, of course, there is diversity. If diversity of function, on the other hand, makes a thing go to pieces, if the only transitions possible are those of identity of property, then we should at least be as consistent as the father of intellectualism, Parmenides, and with him rule out all diversity as inconceivable, leaving the residuum of the homogeneous block of "being."

Another intellectualist prejudice of which we must rid ourselves is the assumption that an individual, in order to be distinct, must distinguish itself. On this basis, only self-conscious individuals could exist, and they only so long as they are self-conscious. We ourselves would vanish as individuals the moment we go to sleep or when our interest becomes absorbed in the objective situation. I do not believe this a valid assumption. Neither the existence nor the significance of an individual need depend upon self-discrimination. We have individual *significance* so long as any experience distinguishes us, whether we are awake or asleep. And the *existence* of an individual is in no wise dependent upon being distinguished. A thing may exist as individual a million years before it is distinguished. It is individual not because it distinguishes itself or we distinguish it, but because, when we do take account of it, we must *treat it* as distinct for the purpose in question.

Nor is it necessary to regard self-subsistence or independence as the condition of reality. If only the self-subsistent were real, then only an indivisible whole, as Spinoza maintains, could be real. Now, it is quite true that the parts must, somehow, hang together. At least the physical world hangs together by its gravitational threads. But such hanging together need not prevent a certain individual play of the parts. The earth hangs together with the solar system, but that does not prevent the earth from having its own motion and history.

For finite purposes at least, it is convenient to take reality piecemeal. And reality has parts and distinctions just in so far as it lends itself to such individual taking, however much the parts may cohere with a larger pattern. It is such pluralism which makes practical adjustment and scientific sorting and identification relevant. The parts or aspects are real, if we must meet them as real. And the recognition of the character and reality of the part may, for the purpose in question, be more essential than the reality of the whole.

It is not necessary, on the other hand, in order to recognize the plurality of the world, to fall into the opposite intellectualist abstraction, that of absolutely independent plural entities such as the old-fashioned atoms or monads. Such an assumption is necessarily suicidal, for since such entities could not make any difference to each other or to any perceiving subject, it becomes impossible to speak of them as having properties or even to prove their existence. Even zero must be part of a thought context in order to be considered as existing. Things are as independent and impenetrable as we must take them. They may exist, as we have seen, independent of our cognitive context. They may come and go, so far as our awareness is concerned, without prejudice to their existence. But in some context they must hang. I cannot conceive of individuals as outside of any context at all, as making no difference to other individuals, for it is through such difference to other individuals, and in the last analysis to human nature, that we conceive of an individual as existing at all. I can see only the possibility of a relative pluralism — pluralism with its rough edges, its overlapping identities — both from the existential and the cognitive side. No center liveth unto itself, in the isolated sense of Leibniz's monad. But such relative pluralism prevents in any case the blank monotony of Eleatic "being." And while the parts hang with each other, they must be considered as real as the whole. The whole has no reality abstracted from just such parts. If the parts are relative to the whole, the whole is no less relative to the parts. If we emphasize that individuals exist and have significance only in contexts, it is well not to forget that they *do* exist within the contexts, social or physical, and can be identified in the variety of contexts into which they enter.

Another and more serious kind of objection has been raised against the reality of things from the Heraclitean point of view, represented so brilliantly at the present time by Professor Bergson. If the universe is an absolute flux, making sections in the stream of change and calling them things must be a purely artificial attitude — an illusion due to our gross sense perception at best and justified only by its convenience for practical purposes. To quote a recent statement of Bergson's: "I regard the whole parceling out of things as relative to our faculty of perception. Our senses, adjusted to the material world, trace there lines of division which exist as directions, carved out for our future action. It is our contingent action which is reflected back in matter, as in a mirror, when our eyes perceive objects with well-marked contours, and distinguish them one from the other."[1] Things, therefore, have no real existence. They are due merely to our practical purposes. The real world is one of absolute fluency, where the past is drawn up into the moving flow. Not extension, but interpenetration; not repetition, but absolute novelty and growth; not qualities, but change, characterize the real world, the key to which must be found in our own stream of consciousness. This real world can be grasped, not by the intellect, but by intuition, which gives us the real flow, as contrasted with the stereotyped copy of the intellect. And how do we come to speak of things at all, then? By means of the intellect we form a space image of the real process. This image is like the cinematographic copy of moving figures. It is a static picture of spatially spread out and recorded changes which we substitute for the real duration. But while the latter is characterized by interpenetration and indivisibility, the former is characterized by extension and divisibility. Science decomposes the objects of sense still further into molecules and atoms and centers of force, but these pictures of science have no more reality than the perceptual things. They are merely contrivances to deal with the world of flux.

Such, in brief, is the view of Bergson, and it certainly carries with it a great deal of truth. Our purposes are indispensable in the significant differentiation of our world; and sometimes, no doubt, our marking the world off into parts is as artificial as the astronomer's longitudes and latitudes and his names for constellations. The world, too, from our finite point of view at any rate, is a world where novelty and growth play an important part. I cannot admit, however, that the new Heracliteanism gives us the whole truth.

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[1] *Jour. Phil. Psychol. and Sci. Meth.*, Vol. VII, No. 14, pp. 386 and 387.

In the first place, we must be suspicious of all absolutistic formulas. Absolute flux is as impossible of proof as absolute identity. Bergson and Parmenides alike must found their philosophy on intuition and conviction. I prefer the more modest pragmatic way of taking the world.[1] This means to take the facts at their face value. If there seems to be change and novelty, then, in so far, we must own it, whether our novelty is a retracing of an absolute experience or is objectively creative. Knowledge, whatever claims to absoluteness we may make, is after all our finite human version of reality; and we have access to no other. And for us change and novelty are real facts. But while we must recognize novelty and interpenetration as facts of our experience, it is also true that we must recognize a certain amount of constancy. And this constancy cannot be due merely to language and space objectification. There must, on the one hand, be constancy in our meanings, our inner purposes; and they are real processes. And there must, on the other, be constancy on the part of the processes referred to. Else constancy on the part of our symbols would not avail. Suppose we had a world where everything flowed but the symbols: in such a world we could not recognize or use the symbols as the same. There could be no such thing as intellect in such a world, because it, too, would have to change. And even if memories and concepts dipped into such a world from another universe, they would be utterly useless where nothing repeats itself. The intellect is an agency for prediction; and what we must be able to predict is the real world of processes. Mind and things must conspire to have science. Even in the cinematograph, you have the constancy of the pictures and of the machinery which repeats them; and they are part of the real world.

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[1] My attitude to pragmatism I have explained in "Truth and Reality," Macmillan, 1911, especially in Chapters IX and X.

Nor is it true of things, any more than of selves, that our marking them off from their context is purely arbitrary. It is difficult enough in either case; and we cannot pull them, root and all, without pulling a good deal of the context with them. When we come to define what we mean by Cæsar, we find that he is very much entangled with the past out of which he grew, with the age in which he struggled, and with the results and opinions of his labors ever since. Yet for all that he is a well-marked character which we can understand and appreciate. So with the thing — the organic individual, like the tree, or the inorganic individual, like the stone or the crystal. In any case, they are individual, when we must deal with them as such; not when we mark them off arbitrarily, as in the case of the rainbow. And this is true though the individual is complex; though it may consist of many interpenetrating impulses, all traveling at diverse paces.

The Pragmatic Significance of Things

When we come to *define* what we mean by the individuality of a thing, the problem waxes more difficult. Psychology gives us but scant help. As a matter of fact, it has tended to unfit us for the proper attitude to reality through its subjectivistic tendency. What we intend when we speak of a thing or act on a thing is not a fusion of sensations, together with the suggested sensory and ideational complex. This is merely an account of the process of *becoming aware* of things and not an account of the reality of things. Things *can* make sensible differences to our organism, but they are not constituted by our perception. They must be taken as preëxisting in their own contexts, prior to such sensory discrimination on our part, else our instincts would not be adjusted to them; they could fulfill no interest or need on the part of our will. The sensory differences, for practical purposes, exist primarily as signs or guides suggesting further control and use. The sight sensations, in the case of the infant, suggest the motor reaction of active touch, which in turn suggests the reflexes of eating.

What, then, individuates things? First of all, from the point of view of significance, they are individuated, as we have seen, by the purposes which select them and which they fulfill.

They would have no individual *significance* except as thus differentiated in our cognitive experience. The thing must embody a will. Aristotle was quite right in saying that we cannot treat the thing as a mere collection. We cannot regard the word as a mere collection of letters, in so far as it is an individual word. "We must seek the cause by reason of which the matter is some definite thing."[1] For Aristotle this means finding the final cause of the thing. In artificial things like the word or the work of art, it is quite plain that we must find the idea which is expressed. Can we also find such an objective idea in natural things? No, we cannot *find* it there. We must be satisfied if it has such distinctness of character and history as to fulfill a specific purpose of ours, whether it sustains the relation of a work of art to a more comprehensive experience or not.

It does not follow, however, that things are created or "faked" by thus being taken over into our cognitive context. The selection and acknowledgment is forced, not arbitrary. The thing must suggest an own center of energy. It must roll out from the larger field of experience, forcing attention to its own movement and identity. Our cognitive meaning, so far from constituting things, must tally with the things — terminate in our perceptions of them — in order to be valid. If the thing is real, it cannot be infinitely divisible, *i.e.* the form of the thing cannot be merely of our own choosing. To be accorded objective existence, the thing must be acknowledged as having its own impulse, its own history, its own pattern of parts, which our ideas must copy sufficiently for identification and prediction. And the thing may have to be acknowledged as having such character and history, whether as old as the sun or as evanescent as the cloudlet.

Can we identify such things in our experience? In the case of the organic thing, we seem to have a natural unity, comparable to that which we have in the case of the unity of the ego, even though the former is not a significant unity. There is a history which embodies a certain end or has a certain direction. To be sure, organisms may sometimes be divided without destroying their life; and the lower organisms do propagate their existence by spontaneous division. But the cell seems to be even here a fairly definite entity. The unicellular organisms have an individual immortality which is only limited by external accident.

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[1] "Metaphysics," Bk. VII, Ch. XVII, 1.

When we come to inorganic things, the problem is difficult. On the analogy of geometrical quantity it has sometimes been held that physical things are infinitely divisible. Interesting antinomies have been invented from Zeno down by playing between the mathematical and the physical conception of quantity. But we must not confuse mathematical divisibility with physical divisibility. Empirically, what we call things are, on the one hand, capable of being taken as individuals. On the other hand, it is possible to distinguish parts. Do we come to a limit in our division where we have to deal with a final natural unity? We do for practical purposes at least. The molecule, which, thanks to Perron, has now been definitely identified and measured, seems like a distinct stopping place, if we would preserve the character of the compound. And in recent years interesting experiments have been made by Rutherford and others to prove the real existence of the atom. These results cannot be ruled out by any *a priori* theory as regards infinite divisibility. The atom in turn seems to be a holding company for energies which under certain conditions can act individually. A smaller unit, the electron, it has been shown, must be assumed to account for such phenomena as radioactivity. The negative electric charge seems like a natural unit. Is it final? We cannot say. All we can say is that we have had no need so far of assuming a smaller unit. There certainly is no evidence for infinite divisibility. Furthermore, because units do not have absolute permanency and are themselves complex, that does not gainsay their individual reality, while we can take them as individual. The chair is an individual while we can use it as a chair, however complex and unstable its structure.

It will be seen that we have adopted the instrumental method in dealing with the reality of the thing. Unlike the self, the thing has no meaning or value that we can share with it. We must judge it, therefore, by the ways in which we must take it in realizing *our* purposes; and we must hold that its reality is precisely what we must take it as in the service of our specific will. Let us now try to sum up the pragmatic significance of the thing. In the first place, we have seen that we cannot speak of things unless we have persistent identity — identity both in the purposes which take the things and in the objective processes which are taken. Unless we can take the same processes over again and thus predict their recurrence, we cannot speak of things. In a world of absolute flux, not even the illusion of a thing could arise. This persistence or possibility of identification of certain processes is the pragmatic significance of substance, whatever fleeting changes we may have to ignore in our conceptual taking of reality. As the thing is capable of existing in many contexts, and as it may have different reactions in different contexts, the idea of potential energy arises. The potential, or the core of the thing, is the more of what the thing can do. The air can produce sound. It can also furnish the prairie dust storm, it can convey oxygen to the lungs, etc. As the contexts are not present, perhaps, for doing all these things at once, we speak of the others as possible reactions — the (for the time being) hidden energy of the thing.

In the second place, these expectancies or ways of taking the thing are social. Things do not merely figure in my individual experience, but they are capable of figuring in any number of experiences in the same immediate way. They fulfill not merely an individual, but a social, purpose. One reason for regarding social experience as more trustworthy is that social experience is less subject to illusions and hallucinations. While this is largely so and therefore furnishes an additional check, illusions and hallucinations may be social for the time being. The illusion of the moving railroad train is as social as any perception. A whole crowd has been known to see a ghost. So being social is not an infallible test of objectivity. As such perceptions, however, do not tally with *further experiences*, they cannot be taken as things. Whether we deal with things, therefore, from the point of view of individual or of social experience, our ideas of things can only be proven true as experience leans upon further experience in a consistent way.

It has sometimes been stated that things are objective, because they are objects for several subjects. But this is inverting the true relation. Things are social experiences, because they hang in a context of their own and are not dependent upon individual experience for their existence. Things, moreover, are not the *only* objects of social experience. It is not true that our psychological objects are objects of one subject only as contrasted with things. If so, we could have no psychological sciences. We could never understand each other's meanings or their relations. The fact is that we can share each other's images, concepts, and even emotions, and will attitudes, as truly as our sense facts. The oldest sciences man created were sciences of meaning, such as logic, geometry, and ethics. It is absurd, then, to say that mental facts exist for one subject only — are private and unique. It is not their social character which distinguishes things from meanings.

Besides social agreement, we must add, therefore, *sensible* continuity as characteristic of our taking of things. Things are the sensible embodiments of purposes. They have a certain "liveliness" that our meanings as such, however social, do not ordinarily have. They are energies which we must recognize as belonging to a space context of their own, with their own steadiness and order, independent of our meanings. It is not that we, either in our individual or our social capacity, *do* acknowledge things, which makes things objective, but that we *must* acknowledge them, and that we must acknowledge them as having such a sensible character, such motion, such use in the realization of our specific purposes. Our ideas must *terminate* in the sensible things in order to be valid. We may select them in our service, we may spread them out into our classificatory schemes, we may symbolize their relations by our equations; but we can do so successfully only by respecting their own character and relations as revealed in experience. We must believe, moreover, that the *substance* of things is precisely what we must take it as in experience. If radium breaks down and changes into helium, no assumption of inert matter, no postulate of substance, can guarantee its identity. The only key we have to reality is what reality must be taken as in the progressive realization of the purposes of human nature.

CHAPTER V

KNOWING THINGS

I

In dealing with things *as known*, we place ourselves at once at the pragmatic point of view — things as they must be *taken* in our systematic experience. In other words, we try to unlock the reality of things by means of their qualities, as we must adjust ourselves to them. This pragmatic way of taking things has at least the advantage of convenience. It is the only *approach*, whether it is the whole truth or not. And by qualities we mean the constant and describable ways in which we must take nature in its concrete contexts. They are differentiated and made significant through the specific conduct which we must adopt in varying situations, — sensory, chemical, electrical, etc. They are diverse or homogeneous just in so far as we must take them as such.

We must distinguish the relation of a thing to its qualities from other forms of diversity and unity.[1] We must not confuse qualities with logical consequences, which exist only as part of a cognitive context; nor must we confuse qualities with the species of a genus, for the qualities cannot be regarded as existing individually apart from their complex. We cannot regard the qualities as effects of the thing, because the thing apart from the qualities is a mere abstraction. We cannot regard the qualities as external parts of a whole, because the qualities only exist as interpenetrating in one dynamic context. The thing is not the sum of our abstractions, such as independent qualities would have to be. Nor are the qualities, as sometimes stated, the behavior of the thing; they must include how the thing *can* behave under definite conditions as well as its actual behavior. They are not the behavior in the abstract, but what a thing must be taken as, or acknowledged, in its specific conduct. Qualities are not inert ideas, as Berkeley supposes, but energies that can be tapped under definite conditions.

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[1] See in this connection a suggestive monograph, "Om Egenskapen," by a Swedish philosopher, Pontus Wikner, whom I count as one of the noblest thinkers of my native land.

Qualities are not merely the actual, but also the potential energies of things, their possible differences to other contexts. When we see the diamond, we expect it also to cut glass, though the visual qualities do not cut glass. Where the conception of quality becomes particularly significant is just in connection with the potential behavior of the thing — what it can do in other contexts. If all the reactions of the thing were exhausted in the one dynamic situation, if the qualities cohered in one simultaneous inseparable blend, we should not have occasion to deal with them. We should always deal with such a world as consisting of concrete units.

The theory that consciousness is perspicuous, and does not alter the qualities intuited, is true enough, if you mean by consciousness the bare character of awareness. But this does not mean that qualities are static entities, to be intuited in the abstract, as the old dogmatic realism, which has had a recent revival, supposes. To regard qualities as abstract intuitions is equivalent to holding that energies can be intuited as at work, when they are not at work. While we can abstract our awareness from the energetic continuities, sensory or extra-organic, that does not save us the trouble of taking account of these specific continuities and giving a definite description of them. This is precisely the task of science. While all qualities are not dependent for their existence upon our sense continuities, as we shall show later, we have no way of intuiting the qualities of things, except by our awareness of such sense continuities. Things by themselves have no properties. They cannot even be conceived as having existence, as this is a dynamic relation — the difference which a fact makes to a context, including in the case of perception the context of our sense energies. And qualities without contexts are a pragmatic contradiction. They are differences which make no difference — non-entities. All that realism can insist upon is that our taking account of the qualities — their figuring in our cognitive context — does not constitute them. And with this probably no one now disagrees.

As a thing may exist in several contexts at the same time, we come to conceive it as having simultaneous as well as successive diversity of qualities. Thus a bit of honey may exist in a number of sensory contexts at once. We see it, touch it, taste it, smell it at the same time. The honey in the meantime is undergoing certain physical and chemical changes independent of the sensory contexts. And so long as this diversity can be attended to at once — fulfills one interest — we do not regard it as fatal to the unity of the thing.

That a thing may have different qualities in different contexts, simultaneous or successive, not only is not contradictory but is continually verified by experience.[1] The difference may be in different sense contexts, when different senses acquaint me simultaneously with the same thing. But the same thing may have simultaneously different qualities within the same sense domain for different observers. Thus it may appear circular to one observer and elliptical to another. It is both circular and elliptical at the same time, but not in the same context, and hence there is no logical contradiction. That we perhaps select the circular shape as our standard is purely a matter of convenience. Quality means precisely the possible reaction of a thing in such and such a context.

Is the thing its qualities? In the first place, if we strip the thing of its qualities, of its possible reactions, what is left is zero — position without content. To try to conceive a surd or core as remaining becomes self-contradictory. When we try to make clear to ourselves what we mean by such a core, we find that it is a certain group of qualities, the conditions for the appearance of which are more *constant* in our experience than those of the rest. Thus the conditions for the touch-motor qualities are simpler and more often repeated than those for the visual qualities. The conditions for such physical qualities as gravity and heat conduction must be conceived as still more universal. Owing to the law of habit, the qualities whose conditions are more constant become the standard of reference for those whose conditions are more intermittent. They come to constitute for us the substance of the thing. No other intelligible meaning can be given to the conception of substrate, if qualities are the ways a thing must be taken in its conduct. There can be nothing in the thing not capable, theoretically at least, of being shown in its conduct. That it is *one* thing, and not a mere sum of discrete qualities, is itself one of the ways in which we must take a thing. It is because qualities can be taken as interpenetrating in one space, as fulfilling one purpose, that we speak of one thing. This, however, does not preclude us from being interested, in other connections, in the diversity of ways in which a thing can be taken. No mere mystical coalescence on the part of our states of consciousness would destroy the diversity of functions on the part of a thing.

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[1] Mr. C. D. Broad, *Mind*, July, 1912, p. 458, in criticizing my position thinks that we have here a contradiction, but he takes qualities as abstract.

If you identify a thing with its qualities, in the second place, you must be careful to include all the possible ways of taking a thing. The ways in which things can be taken not only connect them with our sensory contexts, but also with other contexts, independent of our perception. Their relation to these contexts may, for some purposes, be more important than the relation to sense. We must learn to take the thing at its face value, as the various ways in which it *proves* itself in its variety of contexts, without inventing hidden essences, on the one hand, or making abstract entities of our ways of taking things, on the other.

Does human nature create the qualities of things? It is true that some qualities, involving a high degree of physiological organization, are only present for the perception of man and the higher animals, as in the case of color. Our perceptual qualities in general do, of course, involve a relation to the organism. But this relation is not constituted by the cognitive meaning. The perceptual qualities are just as independent of the cognitive context as the chemical. It is true, further, that we have perceptual illusions. But this is due to no "faking" of qualities, but to the fact that qualities can only be *known* through the machinery of complication and association. As some qualities may be common to different contexts, it is possible that the sensed qualities may suggest the wrong system of associates at any one time, either as the result of habit or from the momentary set of attention. Further experience shows in such a case that the supplementary qualities thus suggested do not coexist with the sensed qualities in the particular thing. But this is a problem in our *knowing* of the qualities and does not concern their reality or objective coexistence.

A good deal has been made of late of so-called physical illusions, such as the apparent bend of the stick when seen in water. What has been neglected here is that in such cases we have to do with a complex, and not with a simple, physical reaction. The apparent bend of the stick in the water is due not to the direct action of light upon the stick but to the physical properties of water. These properties, therefore, must be allowed for, as they actually are both in physics and in practical experience. Even the savage, in spearing fish in the water, learned to allow for the refraction of the medium or he would not have secured any fish. We select the apparent shape of the stick in the medium of the air as standard, first, because, even before we had discovered any such medium as air, the visual properties and the tactual properties under such conditions are found to lead to the same practical results; and, secondly, because, after discovering air, we find that its action can here be ignored for practical purposes. There is no more illusion here than in the case of the varieties of visual shapes and sizes at various angles of seeing. These are real physical qualities. It is convenient, however, in such cases to standardize our visual qualities in terms of our tactual, and so we ignore the other "appearances" for ordinary purposes. But such standardization is not a question of reality, but of social convenience. If our purpose is to draw an object in a certain perspective, it is precisely the apparent properties which become essential.

As regards our perceptions of distant objects in space, such as the stars which appear to our senses, here, too, the difficulty disappears when, in the manner of science, we take account of the whole situation. The problem in this case is complicated by the time aspect of the situation. We have no guarantee, it is true, that the star which we perceive continues to exist, in its own spatial context, as we perceive it. But if we qualify the perception by its space and time conditions, we have a right to say that the object is such as the telescope and spectroscope reveal it to us.

Again, if our senses were different — if they were grosser than they are now or if they were microscopic — the structure of things would no doubt appear otherwise than it does. Blood seen through a powerful microscope is not the red juice our bare senses reveal to us. It consists only in small part of colored corpuscles. But we must remember that we are here dealing with a different context of reactions. It is still true that blood is the kind of thing which we can take as reddish in our ordinary sense context. The grosser reaction of the thing is as true as the minuter. In each case the properties are indisputable so long as we specify the context. The mass reactions are as true as the atomic reactions revealed to the delicate instruments of Rutherford. In any case, we must take the thing as we find it in the specific context of our experience.

That we do not know all the properties of things, owing to the limitation of our finite instruments — our senses and our artificial instruments — and owing to the indefinite number of possible situations, must be admitted. This means relative agnosticism; and to this, all honest science must subscribe. Yet we may still maintain that our knowledge is of the real, so far as it goes; that it approximates reality in our systematic effort for truth, and does not lie in another dimension from the object which we attempt to know. The unknown is continuous with and interpenetrates the known; and however far we may be from knowing all the properties of things in their possible contexts, yet the thing can be taken as having the properties we do know. Human nature as cognitive does not create qualities, though it is an indispensable condition for their significance.

That observed qualities and relations are not invalidated by our ignorance of the rest of the qualities is beautifully illustrated in the history of the physical sciences. There has been, especially since the discovery of radioactive elements, a pretty complete overhauling of our conceptual models of physics and chemistry; yet not one empirical formula based upon accurately observed properties has had to be revised. The same is true of the observational and experimental work in the biological sciences where new discoveries have proved no less revolutionary. The immense amount of classificatory work done in those sciences before Darwin remained undisturbed by the Darwinian theory. The discovery of new properties and laws has not vitiated our past facts. It has only vitiated some of our speculative assumptions.

Absolute agnosticism, on the other hand, has always maintained that, even though our research were complete as regards the seeming nature of things, yet we would be as far from knowing the real things as ever. It insists that the thing is something different from its apparent qualities, were they all known. It is difficult to understand the mental attitude implied in this position. If it means conceiving a thing apart from its properties, then what is left is zero, and there is nothing mysterious or unknowable about zero. If, on the other hand, it means that the thing-in-itself does have properties, but that these are different from those which we perceive; that human nature has created the qualities as we have them, and that the true qualities could only be perceived by a consciousness entirely different from our own, which seems to be Kant's position — if such is the assumption, all we can say is that it is entirely gratuitous and has no pragmatic value. In any case, the only fruitful method of procedure is to assume that qualities are such as we must take them in relation to our systematic conduct. The agnosticism of the unconditioned, in the sense of a reality outside the matrix of concrete relations, is a fiction of the faculty of abstraction. We must hold, on the contrary, that reality is known in its concrete determinations. And we are ever striving to increase our knowledge of things by trying them out in new determinate situations. It is by such experiment and observation that we find the melting point and freezing point, the resistance, the complexity, the decomposability, and the coherence of the world as we have it.

Whether the persistence of certain ultimate units, such as atoms or electrons, turns out to be more than fiction or not, the reality and persistence of qualities is a *sine qua non* of science. Not only can we predict that a certain set of qualities shall make its appearance, with the Aladdin change of conditions, but what to me is still more striking, we can predict that certain identical qualities shall *persist*, as a set, through the protean transmutation of things, with their characteristic energies.

Such is the case in chemistry with salts in the wider sense, including acids and bases. To quote from Ostwald: "Salts are, therefore, characterized by the fact that in solution their components give individual reactions which are in each case independent of the other component present in the salt. And this relation is a reciprocal one; the second component also shows its own reactions independent of the first. These components of the salts which react independently of one another are called *ions*."[1] This persistence of qualities as seemingly individual energies is shown even more strongly in the case of biological heredity. The chromosome characters of the germ cell, which are now believed to constitute an important part of the factors in the transmission of characteristics including sex, constitute a qualitative constellation which is constant in the particular life form, whether as regards sex or species. Mendel's law formulates in general how the "unit characters" appear in the reproduction of individuals. "The essential feature of Mendel's law is briefly this: hereditary characters are usually independent units which segregate out upon crossing, regardless of temporary dominance."[2] Mendel, in his experiments on garden peas, found that in crossing tall peas and dwarf peas, the offspring would all tend to be tall. This held true irrespective of the sex of the tall parent, showing that the character of tallness was independent of sex. Mendel called the character which appeared in the first generation, the dominant, and the one that was latent, the recessive. In crossing the offspring, the progeny would consist of talls and dwarfs in the proportion of three to one; but of these talls only one proved to be pure. The other two, when crossed, would reproduce the proportions obtained in interbreeding the results of the first cross. If interbreeding between the different strains is prevented, the tendency will be for the original characters to assert themselves, and the number of individuals with a blend of characters in their germ plasm, such as obtains in the impure tall strain, will become reduced in proportion to the numbers of those bearing the original characters in pure form. In the case of crosses between certain species, the intactness of the original characters is provided for by the sterility of the hybrid carrying the blend of those characters, as in the case of the mule. Thus the original characters tend to reappear intact, and the race in the long run would tend to run pure. The problem, it is true, is more complex than Mendel foresaw. Thus the relation of dominant and recessive is not an invariable one. In some cases both strains assert themselves equally in the first generation. Moreover, it is not always possible to segregate single characters, as Mendel supposed. Sometimes two characters are linked and act as one. But for all that, the Mendelian conception of unit characters is highly convenient in dealing with heredity.

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[1] Ostwald, "Principles of Inorganic Chemistry" (1902), English translation, p. 189.

[2] "Genetics," H. E. Walter, New York, 1914.

The characters or qualities thus constitute the pragmatic significance of the thing. And if science can abstract the characters or qualities so as to predict the behavior of nature in its stages of change and complexity, things are of secondary importance. Or rather, the identity of characters *is* for science the substance. Even the chemical elements have fallen into a "natural series" on the basis of identical characters. Whether these elements prove ultimate or not, the qualities and the predictions based upon them remain as of prime importance in conceptual description. We must start with qualities and hold the individuals, as far as we can, in the net of our identities. Concrete individuals, on the other hand, seem to come and go. They probably never quite repeat themselves. What is predictable are the recurrent qualities — the *karma* as the Buddhists called it, in the case of moral qualities.

While this abstract view of qualities, however, is convenient in our ignorance in unlocking the secrets of nature, we cannot regard it as metaphysically final. In reality there are not "unit characters," as Mendel calls recurrent qualities, but dynamic *situations* hanging together by means of certain overlapping identities. Thus it has been shown by Professor E. B. Wilson that chromosome characters are not sufficient by themselves to determine heredity, but we must take account as well of the potentials of the protoplasmic context in which they exist, though of course this would not prevent our having predictability by taking account of the chromosome characters alone, the protoplasmic conditions remaining practically the same. The whole concreteness of the situation is not necessary for prediction. If it were, we could not have science. For ethical and æsthetic purposes, again, the individuals, whether transient or permanent, may have final and eternal significance.

Finally, the fundamental law of the thing, as of the self, is interpenetration. This is the only *a priori* law of substance. Unless the mind were so constituted as to locate in each other's space those qualities which fulfill one interest, figure in one attention act, there could be no such process as learning by experience. Suppose that Bergson were right that the fundamental law of the material world is juxtaposition, side-by-sideness of images, the spatial spreading out of impressions like the record of the cinematograph or of the plate of the gyroscope. In such a world we should have hopeless chaos. Such unities as things could never arise in perception and consequently there could be no practical adjustment to our world. The intellect would be a useless instrument at best, an anomaly in such a world. What is exclusive is the old mechanical model of atoms which is fast breaking down. What is absolutely fixed are our mathematical symbols. Fixity in the world-as-experienced is a relative and approximate affair, not something we can take for granted. What has been emphasized by the electrical conception is precisely this interpenetration of energies in the so-called atom, the *durcheinander*, and not the juxtaposition of qualities. The atoms must be conceived, not as impenetrable entities, but as more or less stable dynamic clusters within dynamic systems. Even the negative electric charge, if it should turn out to be a final entity, exists primarily in interpenetration with other elements. At any rate this conception, whether its symbolism is final or not, has taught us that energetic interpenetration and overlapping characterize the ultimate constitution of our world.

If we speak of interpenetration as an *a priori* law of our perception, we do not mean it is an arbitrary law. Mind, in its long survival history, has been shaped on things. This is what makes it practical. The law of interpenetration is convenient just because it enables us to meet the actual world as ascertained by experiment and as fulfilling the requirements for action.

II

Having now defined in general the nature of qualities, I wish to say a word about the problem of their *relative importance*. The distinction between primary and secondary qualities is an ancient one. There have been several reasons for making some qualities more important than others. One reason offered in the past is the mode of intuition. The primary qualities are suppposed to be immediately intuited, according to such writers as Thomas Reid, while the secondary qualities are supposed to be due to our sense reactions. To use Reid's own language, "Our senses give us a direct and distinct notion of the primary qualities, and inform us what they are in themselves: but of the secondary qualities, our senses give us only a relative and obscure notion. They inform us only that they are qualities which affect us in a certain manner." [1] According to this theory the primary qualities would be not only copies but identical with reality, while secondary qualities are only ways in which the primary qualities affect our sensibilities. Thomas Brown, however, already recognized that there is no essential difference between qualities so far as the mode of perception goes. "I cannot discover anything in the sensations themselves, corresponding with the primary and secondary qualities, which is direct, as Dr. Reid says, in *one* case and *relative* in the other. All are *relative* in his sense." [2] They are all alike in being reactions of our organism upon the selected stimuli. Nor is there anything inherently depraved about sense that would make qualities subjective or unreal, just because they are sensed.

Again, qualities that are perceived by means of a number of senses have been thought to have a superior reality to those perceived only through one sense. Thus form, size, position, and motion are perceived by sight and touch alike. But solidity, which has figured as one of the most important of the primary qualities, can only be had by means of the sense of active touch. So perception by a number of senses cannot be all-important.

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[1] "On the Intellectual Powers," Essay II, § 17.

[2] "Lectures on the Philosophy of the Human Mind," 1828, pp. 253 f.

It has been argued again that the more generic sense qualities are more real than the more specific ones. Because the generic sense qualities lend themselves best to mathematical description, it has been supposed that they come nearest to giving us the reality of nature. Secondary qualities on the whole are due to greater specialization of our sense organs and have seemed to be more subjective. But it is a fact that some of the generic qualities do not seem to figure high in the scale of information. Thus pain and temperature are among the most generic of our sense qualities, but they have not been recognized as belonging to the primary list. Because the conditions for the manifestation of the qualities are complex, it does not follow that the qualities are less real. The conditions for the making available of electrical properties are exceedingly complex, but we do not on that account doubt the reality of electricity.

Again, qualities have been deemed subjective or objective according to their clearness or distinctness to the attention. The primary qualities, according to Descartes, are clear and distinct, while the secondary qualities are held to be confused. But according to this, color and tone would rank at the head of the list, because there we can distinguish more qualities and arrange them in a serial order with greater success than we can in the other senses. This is especially true of color, where the largest range of qualitative discrimination and arrangement is possible; but neither color nor tone was included in the old list of primary qualities, though they permit of the greatest analysis.

More convincing is the argument based on their value for prediction. The primary qualities, according to Locke, are constant and inseparable while the secondary qualities vary. While this is true, to a certain extent, shape, extension, and weight cannot be regarded as invariably present in the physical objects with which we must deal. We cannot speak of electricity, for example, as having either shape, extension, or weight. These qualities, therefore, cannot be regarded as universal, as Locke would have us think. On the other hand, the qualities just mentioned are only constant when conditions are the same. In this respect, therefore, they have no particular advantage over the so-called secondary qualities. Mass varies with temperature and with pressure, and it has been shown recently to vary with velocity. Velocity approaching that of light has been found to increase the apparent mass. But that qualities differ under different conditions certainly does not indicate any subjectivity. If so, we would have to conclude with Berkeley that all qualities are subjective. Constancy for science always means repetition under determinate conditions.

One reason for the distinction between primary and secondary qualities has doubtless been the confusion between qualities and values. The so-called secondary qualities have been rejected in part, no doubt, because of their affective tone. This affective tone is especially prominent in connection with such qualities as those of taste or smell. But Aristotle, long ago, pointed out that touch may be the most sensuous of the senses, and therefore carry the most violent organic tone. We would, therefore, have to reject touch as well as taste. In fact, we would have to reject most of our sense qualities.

Evidently, one difficulty in making up the classical primary list, which for the most part remains approved, was the lack of scientific knowledge. Thus the old list fails to include weight, which has since come to be regarded as one of the most important of the descriptive qualities. The old theory of primary qualities, moreover, presupposes the impact theory of physical changes, and so emphasizes extensive mass as fundamental and universal. This will have to be revised in the light of our more recent knowledge of electricity and radioactivity. Such energies have brought to light a whole list of descriptive properties which were unthought of in the old catalogue. Certainly, impact would be far too gross a method of describing these reactions.

Whatever basis we can find for distinction, as to the importance of qualities, it is clear that any such basis must be relative, not absolute. It is relative to the purpose in question. What is primary for one purpose may be quite secondary for another purpose. Thus the importance of the mechanical qualities is quite secondary for æsthetic purposes, while color and tone become of very great importance. *Qualities must be considered as objective, if they enable us to identify and predict the things with which we must deal.* And in this the so-called secondary qualities may be fully as important as the so-called primary. Locke himself, in giving us the description of gold, does not fail to mention its yellowness. In the identification of a gas, the odor may be of the greatest importance. In identifying a solution, as a saline solution, the sense of taste may be worth all the rest. Qualities are objective just in so far as we must take them as objective. If they do not help us to identify an object, they can no longer be called qualities. They must be reckoned on the side of value.

Some qualities can be taken as existing independently of the reaction of the human organism, though of course they must make a difference to the context of perception, too, in order to be known. This, however, is secondary in importance to their reactions in other contexts. Thus, we have more confidence in weight as determined by the mechanical scales than when indicated by our sensory quality of strain. For the purpose of science we must determine our conduct with reference to weight as fixed by scales. In determining temperature we place more reliance on the thermometer than on the sensory differences of hot and cold. And so in regard to size, we have more confidence in size as determined by certain standard measures which are kept under artificial conditions than we have when we depend on sensory qualities. We must take some qualities as existing in contexts of their own, independent of the organism. This fact is doubtless what has given rise to the conception of primary qualities, and what makes Locke speak of these as archetypes which we copy, though even from this point of view there is not complete consistency, as can be seen in the case of heat and weight, which do not occur in Locke's primary list. The relation, however, is not that of copying. In fact, cognitively, the sensory differences would necessarily come first. The relation is rather that we can take the qualities which are sensed as identical with the qualities in other contexts, for example, that of the scales.

Such qualities as color or taste, on the other hand, must be taken as requiring specialized organic conditions. While the light waves have qualities in other contexts, such as revealed by the camera film and various pigments, these are not the qualities of the sensible context of color. It does not at all follow, however, that because some qualities can only exist in the specialized context of certain sense organs that they are therefore subjective. Because we can only get water under the condition of H_2O, it does not follow that water is subjective. The context of our retina, with its rods and cones, in connection with light rays, is just as real a context and just as independent of our will as that of any other chemical or physical reactions.

There is only one meaning, so far as I can see, in which we could speak of subjective qualities. And that is, if we speak of *having* qualities as itself a quality. Thus some would say that the sky has the quality of having the quality, blue. In this case we can easily suppose an infinite series, because the quality of having qualities can be repeated on itself any number of times that imagination chooses to conjure. Obviously this is a purely subjective process — a creation of intellectual abstraction. It does not add anything to the existence of qualities.

Any quality may be treated as a sign or secondary to other qualities for the specific purpose in question. Thus visual qualities may be treated as secondary to tactual and these again to chemical, when the purpose is the satisfaction of hunger. But for the purpose of enjoying a painting or reading a book, the tactual qualities become signs or secondary, for the normal person, to the visual. In space perception, touch may serve to call up a sight map and this in turn to suggest motor sensations.

In any case, when we are dealing with qualities we are not concerned with the relation of a thing to consciousness, but with its relation to a determinate energetic context, whether that be physiological or physical. Qualities are certain permanent expectancies which we can have with reference to things under definite conditions. The purpose in question, whether mechanical or economic or æsthetic, must decide the importance of the qualities so far as that particular context is concerned. All qualities, in so far as they are qualities, must be taken as real. Their acknowledgment is a forced acknowledgment.

III

There has been a tendency ever since Berkeley to confuse *sensations* and sense *qualities*, and on account of this confusion to insist upon the subjective character of the sense qualities and all qualities. Now, it is quite true that, in order to become significant, qualities must become a part of the context of our cognitive experience; but this does not prove that qualities have no other status than that of experience. Berkeley, we all admit, is wrong in supposing that, in knowing the qualities, the observer, whether human or superhuman, creates them. Qualities, we have seen, have their own energetic contexts, whether in relation to our organism or independent of it. We must take account of the changes of nature, its growth and decay, quite irrespective of whether we are conscious of it or not. Berkeley, on the other hand, truly states the relation of qualities to our cognitive attitudes. "To explain the phenomena is all one as to show why, upon such and such occasions, we are affected with such and such ideas."[1] But he is not warranted on that account in saying that the qualities are nothing but ideas. This is confusing the *causa cognoscendi*, or the reason for our knowing, with the *causa essendi*, or the reason for existence.

Taking a content as a quality, moreover, and taking it as a pure sensation are two entirely different attitudes. Taking it as a sensation means the bare awareness for a subjective interest, without relation to an objective context, while taking it as a quality means taking it as a part of a specific context, fulfilling a purpose. Taking yellow as a sensation or having a yellow consciousness is a different attitude from yellow as a quality, as in recognizing gold as yellow. Whether there ever exists in experience a pure sensation, we will not argue here, but the logical distinction is none the less clear. The reference or attitude is quite different in the two cases. We can never say, therefore, that our sensations constitute the thing. Calling them sensations already indicates that they are taken in the context of a subjective interest, apart from the context of things. What is objective is the sensible qualities — the qualities as perceived and as they must be taken again under similar conditions. A sense quality is not a pure sensation, but conditions the selective interest and remains independent of its variations. Things are never merely sensed. Qualities are qualifications of a certain interest in the world *as sensed*. Thus we qualify our interest in the thing, chair, by the way it appears to the touch and the way it appears to sight, and to various other senses. We never make the mistake of eating or clothing ourselves with sensations, but we deal with things as sensed. Part, at least, of Berkeley's convincingness lies in his playing between things as perceptions and things as perceived.

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[1] "Principles of Human Knowledge," § 50.

Furthermore, sensations persist after the sensible continuities, which make us attribute them to things, no longer exist. This can be seen in complication — the sensory revival, which gives us the concrete perceptual object, on the reëstablishing of sensible continuity; in illusion, where the wrong sensory complex is stimulated; or in hallucination, where the sensory context is intraorganically reëxcited. In all these cases of the revival of sensory elements, we must distinguish between their existence as subjective states and their being taken as qualities of things. Sensations can be taken as qualities only in so far as they are actually or signify sensible continuities. As such sensible continuities they can be taken twice, *i.e.* as figuring as part of the sensed object and as figuring in the context of our interest. But it is the identical quality which figures in the two contexts. To the sensations, as persisting as sensory elements after the stimulus, we may apply Professor Stout's term of "psychic existents." But this merely signifies that they have a locus within the context of interest. They still remain physical facts. And, in perceptual assimilation, they still figure as qualities of the thing. The ice looks cold and hard.

Some sensations are not normally taken as sense qualities. Some sensations, for example, inform us, not of qualities primarily, but of relations. Thus, the joint sensations, the sensations of the semicircular canals, the sensations of contraction and expansion of muscles and tendons, though they contribute a great deal to our consciousness of space relations, do not ordinarily inform us about any new qualities of the things involved. Other sensations, again, like the organic sensations in the more specific sense, such as hunger, thirst, sex, nausea are so vague and so fused with the feelings that they do not inform us about the objects, but about the way in which the objects affect the welfare of our organism. They, therefore, come to enter as a part of our sense of value, instead of being taken as qualities of the thing. It seems, however, that the organic sensations do contribute a certain coefficient of existence, in the sense of presence, which may be regarded as qualifying the object. In such sensations as those of taste or smell, the accompanying affective tone seems the more important part of the situation.

Again, it is indifferent to some qualities that they may be sensed. Of these, the sense qualities may be regarded as signs. The reality of such qualities we take to be their existence in the extra-organic context. Our consciousness or perception of the explosion does not make the explosion occur, though it indicates the connection of the explosion with our sensible experience and so makes it significant to us. The knife in the drawer grows rusty and loses its sharpness, though we have not perceived it in the meantime. The chemical changes in such cases must be interpolated by ourselves, when we establish sensible continuity with the thing. Our physical instruments are often far more sensitive to certain changes than our gross senses. Where the senses, even when equipped with telescopes, fail to see stars, the more sensitive film of the camera still records them and makes it possible for us to count them. A large part of the qualities of nature we must take account of in this *a posteriori* fashion. Our taking account of the coexistence of qualities does not make either the coexistence or the qualities. The intellect, while a coupling agency, fulfills its function, not when it couples arbitrarily, as Kant would have us believe, for then we have illusions, but when it couples in such a way that our conjunctions tally with the conjunctions of qualities as ascertained through experience.

CHAPTER VI

KNOWING THINGS (*Continued*)

Things and Relations

THE problem of relations is one of the most controversial in the history of thought. It will be impossible here to enter into these controversies in detail. We shall touch on them only in so far as they throw light upon the exposition of the problem itself. And in this exposition we must limit ourselves to a few fundamental considerations. At the very outset we are struck by the fact that the status of relations is a matter of considerable confusion. Those who start with the conception of a heterogeneous manifold, whether sensations or physical elements, naturally look upon relations as accidental. It has been held by some, notably Kant and Herbart, that relations are subjective additions to our world. We are supposed to start with simple sensations or simple qualities; and the mind is supposed to synthesize these by means of certain categories of its own such as space, time, and causality. Now it is true that, in our weaving the facts of experience into our apperceptive systems, certain subjective elements enter in. Our space orientations are made, first of all, with reference to our organism, as the center of its world. Nearer and farther, right and left, up and down, have their basis in the kinæsthetic sensations of the organism and its adjustments to meet its individual needs. Our consciousness of the immediate duration of intervals depends, for shorter intervals, upon certain sensations of attention strain, and, for longer intervals, upon certain rhythmic organic functions such as digestion. Our indirect dating of events as before or after is likewise due in the first instance to our subjective interest which arranges events in a personal series. Our number consciousness, in like manner, has its start in certain subjective processes of counting and thus bringing objects, which are perhaps innocent of any number order, into an order of our own, as first, second, third, etc. Causality means, in the first instance, a certain consciousness of control over our bodily movements and the manipulation of external things through them; and we naïvely read into the world outside of our organism a similar type of agency. Our quantitative and qualitative series have their root in certain practical interests. These condition the measure of our quantities and the basis of selection for our qualitative order. But while it is true that our consciousness of relations has its start in our subjective interests, it is not true that these constitute arbitrarily the relations thus taken account of. In our social interactions, we learn to abstract from what is peculiar to our personal interests and to recognize relations that are valid for all of us. We construct a common world of spatial distances, temporal sequences, causal expectancies, numerical diversity, quantitative and qualitative identities and differences. The units of measurement and the starting point of our ordering are conventional enough. But, in any case, our mental processes relate to concrete complexes in which the relations are as real as the qualities or ensembles of qualities which we abstract as terms.

Instead of starting from the learning process, and regarding relations as subjective because, in order to be known, they must come to figure in the contexts of our interests, Bradley[1] and others have started from logical considerations to impugn the reality of relations. Here, too, the difficulty will be found in certain initial assumptions. If we start with abstract unrelated terms, we may find it difficult to furnish any cement which will hold the terms together. By a trick of language, Bradley, at the outset, substantiates the relations into things. He then argues that in order for the relations to unite the terms, they must either have something in common with the terms to be related, or be wholly diverse from them. In the former case, what they have in common would have to fall apart from what is diverse. Otherwise we would have mere identity. We are therefore left with the second horn of the dilemma; and however we proceed in our attempted synthesis, reality must always disintegrate into mere diversity. To take a concrete example: if you say that the book is on the table, then the relation *on* would itself have to be taken as an abstract entity, and it would be necessary, in turn, to relate this to the table and the book and to repeat this process indefinitely. It would follow that the book could not possibly be conceived as being on the table.[1]

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[1] "Appearance and Reality," Ch. III.

To obviate this embarrassing dilemma, Royce proposes to accept the problem as stated by Bradley at its face value, but to seek the solution in the concept of an infinite series. We have no quarrel with infinite series. They are creatures of definition and no doubt exist in the world of conceptual construction. The concept of infinite series signifies merely that we can conceive collections where a part can be put into a one-to-one correspondence with the whole. That holds true in the logical concept of number. Our contention here is merely that the hypothesis is irrelevant. Bradley's dilemma would not be affected any more by an infinite than a finite regress. It contains no law or order which points to a limit. It can only be resolved by an examination of the initial assumption which seems to be false. We are not given abstract terms or abstract relations as the units of experience. Terms and relations are pragmatic. They are our emphases in the service of the dominant interest for the time being. The real units of reality are neither terms nor relations, but energy systems from which the terms and relations are intellectual abstractions.

The relations, moreover, as we know them in our real world, are finite relations. The series of grays which we can discriminate, in the case of our light sensations, are a definite number, dependent upon certain psychophysical conditions. The camera may distinguish still other shades which lie outside the sensitiveness of our retina; but it, too, distinguishes a definite number, conditioned by its peculiar structure. Even in the case of infinite series, the relations upon which the law of the series is based are finite.[2] Bradley is quite right that relations are meaningless when taken as pure abstractions.

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[1] See James' criticism of Bradley, "Essays in Radical Empiricism," Ch. III.

[2] See "Truth and Reality," pp. 141–145.

What could *on* or *in* or *of* or *between* or *distant* or *before* and *after* mean if they were taken as things in themselves? They do, nevertheless, have real meaning if taken *within* their proper systems. The book being on the table means something different from its being under the table. If we would understand further how the book *can* be on the table, we must take account, not merely of the space system of relations, but of the physical system with the properties implied. If table and book were liquids instead of solids, it might be impossible for the book to stay on the table. Alcohol will not stay on water; the two mix, which, however, is not the case with oil and alcohol. To ascertain, therefore, whether certain relations are contradictory to reality, we must investigate empirically the nature of the particular complex. The intellect finds nothing contradictory about this procedure unless it has been debauched by a false metaphysics. Nor is it clear why æsthetics should possess a superior type of solvency to that of science. Æsthetic systems do, indeed, furnish a certain type of unity which can be taken at its face value wherever realized, but this is no substitute for an intelligent understanding of our world. And æsthetic unities, too, are capable of being translated into logical terms without dirempting their æsthetic reality. For our practical purposes, it remains true that Chicago is so many miles west of New York; that childhood and youth with their unique characteristics precede maturity and old age, rather than the opposite; that our comparisons of similarities and differences, our causal expectancies, our quantitative and qualitative ordering, our numerical distinctions, our syntheses into things and persons, *are* relevant to the world with which we deal. It is in this relevancy that their convenience lies for our practical or logical procedure.

Another tendency goes to the opposite extreme and would state things and qualities entirely in terms of abstract relations. For this type of attitude, the terms are constituted by the relations, and their reality lies in being intersection points of relations. This attitude hearkens back to Schelling's philosophy of identity, where subjective and objective entities are supposed to be equally neutral — determined purely by their logical context. As recently stated, the theory is the outcome of a certain extreme type of intellectualism which would deal with reality after the pattern of mathematics and deduce its variety from a few simple postulates.[1] It has transferred the ambiguity of mathematics as regards the existence of terms to the conception of reality in general. In geometry it is true that we can start either with points as determining lines, or we can start with lines as determining points. The ambiguity here is not real so long as we make definite our initial postulates. The terms and the relations are alike constituted by the type of geometry which we choose to have, whether a point geometry or a line geometry or some other kind. They are predicative functions within the system which we select or posit. Their simplicity and complexity are determined by their function within the system. Thus points may be regarded as uniquely simple when conceived as determining the direction of a line. They may be regarded as infinitely complex when conceived as the intersection *loci* of an infinite number of lines. But in any case they can be conceived to exist only within a system, as uniquely determined by its postulates. No blame attaches, therefore, to geometry within its own domain.

Neutralism in metaphysics seems to owe its plausibility to its playing upon an ambiguity, at one time translating entities into relations and at another, relations into entities, without adhering to any definite set of postulates. When the relations are made the center of regard, the entities come to seem neutral. Instead of realizing that such emphasis is pragmatic, convenient for a certain partial purpose, the neutralist makes it absolute. Hence he postulates a world compounded out of neutrals with no structure or potentialities, but constituted solely by relations. Since such neutrals must be indistinguishable, they are regarded as simples. The fact is that they are nothing at all. The relations have become the only reality. The terms or substantives have been exhausted in the relations. The former are so completely internal that they cannot point to possibilities in other contexts. Not even the grin remains of the metaphysical cat. Or at any rate, it is supposed to be purely a function of position. But a world compounded of neutrals could give us no mosaics. It could give us nothing at all. Reality is known, not in "neutral mosaics," but in energy systems. In each of these we must observe the unique ensemble of properties. We must discover empirically how far certain characteristics of the components reappear in a new ensemble, and how far the new ensemble has unique characteristics of its own. The potentialities can never be said to be exhausted in any one system. They are practically infinite in the possible qualitative and quantitative variations of our world. It is this aspect of potentiality which gives pragmatic significance to the terms thing and substance.

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[1] This movement, which in this country has gone under the name of "the new realism," seems to have found its inspiration in Bertrand Russell's "The Principles of Mathematics." It found a conflicting expression in the composite authorship of "The New Realism," 1912; but its extreme and most consistent statement is furnished by Edwin B. Holt's "The Concept of Consciousness," 1914. Russell's own theory, as found in his later work, Russell and Whitehead's "Principia Mathematica," makes entities "predicative functions," which, so far as I can understand it, would be similar to the pragmatic view. R. B. Perry, in his "Present Philosophical Tendencies," 1912, takes a compromise position, emphasizing the externality of the cognitive relation. The conception of neutralism, which characterizes the above movement, has been greatly influenced by William James' essays, "Does Consciousness Exist?" and "A World of Pure Experience," first published in the *Jour. Phil. Psychol. and Sci. Meth.*, 1904, and since reprinted in "Essays in Radical Empiricism," 1912. James in turn had been influenced by Avenarius.

If, on the other hand, we conceive the entities as simple and absolute, then the relations come to seem neutral and accidental. They can make no difference to the terms, the latter remaining identical in all the variety of contexts. The external combination of the simples in certain numbers and density is deemed adequate to account for the complexity of reality as we have it. To be sure, if the terms, by hypothesis, equal zero, it is hard to see how they could undergo any transformation in varying combinations; and if the relations are neutral, too, what remains out of which to build a real world with its changing variety? As over against such a world of pure abstractions, the real world seems to be one of creative synthesis and real change. While we must approach reality by means of abstraction in trying to predict and control its flow, this always leaves something more, and this more constitutes the movement of the process. We cannot compound our world out of abstract universals. Universals are edges, handles by means of which reason lays hold of reality, but they are only serviceable when they dip again into the concrete situations. Our definitions do not constitute reality. They are asymmetrical formulæ, which, while they imply and lead us to the real situations, are but meager abstracts from them.

The theory of external relations has been restricted by some to the experience relation or the relation of interest. It has been held that it makes no difference to reality that it figures in our mental systems. The knowledge relation, for example, is supposed to be neutral. This attitude, again, seems to rest on an ambiguity. If what is meant is that the cognitive relation does not affect the physical qualities of the things, it is in the main true. Our taking account of the gravitational system or the combining valencies of chemical elements does not, as such, alter these facts. This is not true, however, if the knowledge relation has to do with the condition of our own organism. The knowledge that we are in a critical condition may accelerate the pulse and produce other complications. And so we do not always inform the patient of his exact state. If what is meant, on the other hand, is that reality would be just the same if it were not known, we are manifestly guilty of a false abstraction. If reality were not known, one important relation would be lacking, viz. that of *being known*, with all that it implies. The cognitive system is just as real as any system. The qualification of interest is a unique qualification which cannot be resolved into any other type of relation. Hence this relation cannot be abstracted from, without our subtracting from reality. It makes a real difference to reality that it is known or appreciated.[1] It is, at the same time, the most momentous of all differences. Without the relation of interest, reality would be stripped of the whole world of significance, and that is a good deal. Back of the "new" neutralism there lurks an antiquated metaphysics, that of abstract things in themselves which are indifferent to contexts. But things are what they are known-as in energy systems. Otherwise they are intellectual abstractions and no longer real. And among such systems, the cognitive system as a unique type of selective reaction, figures as one.

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[1] F. C. S. Schiller, Dewey and the Chicago School have emphasized the creative contribution of the cognitive relation, but do not seem clear as to what it contributes or rather as to what it does not contribute.

If we pass now to the types of relations, we can see again the advantage of the pragmatic approach. The tendency of the human mind has been to emphasize some types of relations and to ignore other types. This has been due partly to temperament, but still more to tradition. Thus we find that some emphasize static relations to the exclusion of transitive relations. While the former type, as for example space relations, has its significance in our understanding of reality, the transitive relations must not be ignored. Reality is essentially on the wing. Movement, confluence, interpenetration, change are of the very tissue of reality. To ignore such relations means leaving a dead skeleton on our hands, instead of the concreteness and glow of real life. Others, again, have emphasized the analytic as over against the synthetic relations. They have been obsessed by the diversities and dissimilarities which appear in our experience. Reality for them has crumbled into a granular mass of elements without cement; and the task of knowledge has become correspondingly hopeless. But in concrete experience there are the synthetic relations, too — the similarities, the fusions, the causal and logical implications. And these must be taken at their face value as well as the discontinuities. It is not for philosophy to make a world in accordance with its prejudices, but to make clear the constitution of the world as we find it. And here the connective tissue, which makes our world hang together, has as much claim as our abstract terms. Both are pragmatic distinctions in the service of our adjustments to the world of our experience. Some, again, have been fascinated by the more intimate relations, the through-and-through relations of logic and æsthetics, and they have no patience for the more external relations. Here, again, the emphasis is true, so far as it goes. The more intimate relations of the logical and æsthetic types are genuinely real. But there are some relations which seem relatively accidental to the facts of which they take account. Not to speak of the mechanical relations in our external world which seem alogical to us at any rate, facts in our experience are grouped, through our temporary interests, into mosaics of contiguities and similarities, in a manner as non-logical as it is irrelevant to their objective connections. Witness the topsy-turvy drama of our dreams and the motley collection of items in a daily newspaper.

There are certain general types of relations which furnish nets for holding together vast masses of facts. Such are the space relations, the time relations, the causal relations, and the logical relations. The space relations have to do with things in space, their spread-outness and arrangement; they do not, except indirectly, imply anything about space itself. We abstract, as we have seen, from our personal perspectives of orientation. We socialize our perceptual relations in terms of certain artificial units of measurement, and systematize them into certain perspectives on the basis of our Cartesian coördinates. But however artificial may be our units, and however conventional our coördinates, it is the space relations of the real world with its pattern of parts that we mean. Again, in our temporal relations, we abstract from our individual perspectives, with their dependence upon our subjective sense of duration and our immediate individual needs. We socialize our perspectives in terms of certain standard units, based upon objective periodicities, such as the earth-clock or sidereal movements. Here, again, our units of measurement are pragmatic, and our spatializing of temporal sequences into one dimension is artificial. But what we *mean* is a stream of real change and real constancy with its nexus of causal and significant dependence, where we can, in a measure, orient ourselves to the present and future on the basis of the recurrences which we read in the past.

The concept of causality comes down to us from past tradition laden with many ambiguities and contradictions. The so called cause-and-effect relation has been regarded by some as a relation of identity or a symmetrical relation. Like all *a priori* statements, this needs to be scrutinized. It does not seem that the effect need necessarily be identical in kind and quantity with the conditions called the cause. That seems, indeed, to be true in mechanical series, disregarding the loss of energy which is dissipated as heat. In the case of chemical changes, on the other hand, new properties may appear in the compound which could not have been predicted analytically from the components taken separately. Electrical changes, again, may give rise to molecular motion or chemical decomposition, as well as to further electromagnetic changes. Chemical changes seem to give rise to neural changes, and neural changes to mental processes; and yet it does not seem necessary to suppose that breadstuff is mind stuff.

But we can no more assume that cause and effect must be identical in space and in time than in kind. Wherever we have action conditioned by distance, there must also be a difference in the time of the action and the reaction. No intelligible conception of energy has been able to avoid a certain spatial discreteness of centers. Any medium invented in the service of a block continuity must in turn break up into discrete impulses in order to account for our actual world. Let us leave out of consideration the fictitious ether; for, in the words of Poincaré, "if it is able to explain everything, this is because it does not enable us to decide between the different hypotheses, since it explains everything beforehand. It therefore becomes useless."[1] Take for instance, the transmission of a charge from one electron to another. "The perturbation is propagated with a finite velocity; it, therefore, reaches the second electron only when the first has long ago entered upon its rest. This second electron, therefore, will undergo, after delay, the action of the first, but will certainly at that moment not react upon it, since around this first electron nothing any longer budges."[2] To use a more concrete illustration from the same author, take a Hertzian oscillator such as is used in wireless telegraphy: "If all the energy issuing from our oscillator falls on the receiver, this will act as if it had received a mechanical shock, which will represent in a sense the compensation of the oscillator's recoil; the receiver will move on, but not at the moment when the oscillator recoils. If the energy propagates itself indefinitely without encountering a receiver, the compensation will never occur."[2] One thing seems certain: the question of the cause and effect relation can no longer be settled *a priori*, but must be settled by experimental evidence. To say that the cause *must* be identical with the effect is as unscientific as that the heavenly bodies must move in circles because these are the most perfect figures; or that the universe must be a sphere for the same reason.

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[1] *Popular Science Monthly*, Vol. LXX, p. 348.

[2] *Ibid.* p. 347.

We cannot say *a priori* whether a certain causal series is reversible or irreversible. In physical science the general assumption is that changes, except for the dissipation of energy, are reversible. This holds in mechanics. It also holds in chemical transformations where the assumption is that no number of step-compounds will affect the final constitution of the compound in question. In organic and psychological series we are not able to predict such reversibility. Again, as regards the continuity of the causal series, we cannot read off the steps of the series from the characteristics of the initial situation. We must plot our curves empirically on the basis of the changes as observed. Even in the case of mechanical motion, it has been shown that particles moving with a velocity approximating that of light, suddenly acquire an increase of mass. In the compression of gases, the curve is constant for a certain range when a discontinuity appears, due to the atomic structure. And so in the compression of solids. It has been shown that metals at a temperature approximating absolute zero, change in conductivity, the latter becoming here well-nigh absolute. Our theories of specific changes, therefore, must be based upon the constitution of reality as actually observed.

On account of the difficulties inherent in metaphysical causation, some have treated causality as a purely phenomenal affair, based upon the fact of recurrence of perceptions in our experience, and the habits of expectancy produced in us. According to Hume, all that we observe is a series of discrete events having no other connection, of which we can take account at any rate, than psychological association. But obviously the changes and constancies which we observe in our experience must have a basis in the actual facts themselves; else the causal predictions would not be relevant to the world with which we must deal. While Hume considers single beadlike events, and can discover no stamp of necessary connection upon them, it has been suggested that the causal relation must be duadic, *i.e.* we must take account of two events in the sequence, in order to determine the series.[1] Others, again, have suggested that, since we must take account of two events and their relation, the causal series is a triadic affair. In neither case do we escape from Hume's phenomenalism. At best, the concept of causality as it has come down to us, is unsatisfactory as an explanatory concept. While it is true that it takes time for certain changes to take place, it is not the aspect of a series of moments or positions which is significant for understanding the real nexus of changes; it is not the moments or perceptual events which cause each other, nor do two or more moments determine the direction of the real changes. They are snapshots, rather, of the order of real changes, — photographic records, as it were, of sequences within the real stream. The series of perceptions in the case of an explosion, — the perception of the dynamite in a certain position, followed by the perception of the igniting of the fuse, which in turn is followed by the perception of the effects of the explosion, — does not explain the event. For this we must understand the characteristics of the factors involved and their relation to each other.

Science has substituted for the old conception of causality, whether occult or phenomenal, the concept of an energy system. We are not concerned with *a priori* duadic or triadic abstract types, but with certain variables, with their form and recurrence, as we find them in concrete dynamic situations. These factors constitute what an older metaphysics used to call the ground of the change. In the simplest type of energy system, that of ordinary kinetic energy, we require three variables which we define for practical purposes as constants, *viz.* mass, space, and time, in the combining relation of $\frac{1}{2}MV^2$. If we wish to account for the behavior of falling bodies, we use the constant for gravity in the particular locality; we ascertain the height from which the body falls, and we measure its velocity in the sequence of moments of the temporal order. What is significant here is not that the body occupies the successive positions of $A - A' - A'' - A'''$, but that we have the constant, gravity, acting under certain spatial and temporal conditions.

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[1] See the articles by W. H. Sheldon on "A Theory of Causation," *Jour. Phil. Psychol. and Sci. Meth.*, 1914.

It is this which gives us the law for the whole series of events. We might call this particular situation triadic, since it can be defined in terms of three variables. But the variables which are necessary must be ascertained empirically for each unique type of situation. They become more complex for chemical compounds, where some eighty different elements with their combining properties must be taken into account, in their varying quantitative combinations. In the case of electric currents, we must take account, not merely of the properties of electricity, but of the conductive medium through which it travels. In the case of mental processes, we must take account, not merely of the variables of mental constitution as conditioned by innate and derived tendencies, but of the physiological conditions, and of the environmental situation; so we can see that our system here becomes decidedly complex. But the significant aspect for us in this connection is that science makes *properties* its starting point. To try to reduce properties in turn to causation would involve an endless and useless regress. We may, of course, analyze the more complex systems into simpler components. We may find that certain properties of the more complex system are not present in the more abstract components; that they are in some sense, therefore, unique functions of the system itself. But that does not make such properties less real in the system where we find them. Some of the properties of water are unique. They are not characteristics of hydrogen or oxygen, but they are none the less real characteristics of water. Perhaps some day we may be able to explain gravity by means of an electrical theory; but in the relations in which we now know it, it will remain just as real as before. What is essential for explanation is to ascertain the properties which are characteristic of the factors as entering into a definite system, whether that system be a chemical compound or human society. Having found their combining form and their degree of recurrence, we can then control the situation on the basis of our knowledge.

Whether, again, changes proceed by infinitesimal increments or by finite drops is an empirical matter, and not to be deduced from *a priori* considerations. The evidence seems now to point to definite finite quanta. Nor have we any right to assume an infinite series of changes of a certain type unless we deal with a pure abstraction such as Newton's first law of motion; and even this we know now holds only for ordinary velocities where mass is constant. We cannot predicate absolute continuity for any concrete series of changes. We cannot say, for example, that A' shall differ from A, the preceding moment of change, merely in position. How it differs must be empirically ascertained. We have had to relearn again and again that our formulæ hold only for a certain range of temperature, pressure, and motion. And, as Poincaré has pointed out, with extreme cosmic changes in these general conditions, all our formulæ might prove false. They are pragmatic merely, and rest upon a certain faith in the practical stability of the cosmic system of which we are a part. There is plenty of room, therefore, for skepticism if one chooses to indulge in it, though the form may be different from the old Humian kind. Most of us, however, are willing to live by faith, so long as we can approximately find our way in the complex web of reality.

It will be seen now that the old time distinction of cause and effect is a purely pragmatic one. It is due to a certain psychological emphasis which may be useful for certain purposes, but cannot be regarded as a final explanation. Whether we regard the hydrogen properties or oxygen properties or temperature conditions as the cause of water will be due to the steps which we select in our procedure, and our psychological bias. Whether we regard the productivity of the soil or the facilities of transportation or the availability of power or the thrift and intelligence of the people as the cause of a country's prosperity is psychological. The real explanation must be found in the unique ensemble of the various factors with their properties. Cause and effect, therefore, whatever value they may have from a provisional point of view, must be understood in terms of their ground or the energy system of which they are partial emphases.

Besides the three general types of relations already mentioned, viz. temporal, spatial, and energetic, we must add a fourth general type, namely, relations of interest. Our being interested in things does not, so far as we can see, directly alter the physical qualities of things, but their *significance* depends upon their relation to interest contexts, such as the cognitive, æsthetic, and volitional. The interest relations may be systematic, as in the working out of our logical, æsthetic and economic purposes, or they may be merely additive. Any fact can be joined subjectively with any other fact by such bonds as *and* or *with* or *plus* or *minus* or other relations of external interest. We must remember, however, that these relations whether additive or systematic, do not affect the existence of our external sense-things and their properties. Things may exist in a double location: they may exist in their own physical contexts, and at the same time exist in our contexts of significance. If we take into account the individual learning process, as contrasted with the social system of experience, this becomes a threefold location, as the individual must ascertain and locate in his own experience, the results of social experience which in turn must take account of the special contexts of nature.

We may take a fact over and over again in our logical systems without transmuting the physical properties of the fact. Their meaning is colored by the significance of the special system, but their physical color remains the same. It is only altered by physical relations. It is true that logical systems are not closed systems. Our thinking connects with our sensory centers, on the one hand, and the motor centers, on the other hand. It thus not only receives its data from the larger world, but through its motor control can effect changes in that world. What we are here concerned with, however, is the logical type of system in its abstractness. And here it is true that we may carry on our operations of thought without affecting the existence or qualities of the things upon which we operate. The great value of the logical system is that by thus analyzing our world and selecting its relevant features, we are able to substitute these few features for the concrete complex of experience. This means both increased insight and increased efficiency. Of course to carry on this logical analysis we may find it useful actually to decompose and synthesize the things with which we deal. But that is another story, and has to do with concrete energy relations and not merely logical relations.

This is true, likewise, in considering the energy effects of thinking as, for example, the using up of food energy and the production of heat, as well as of the direct effect of our emotional and volitional attitudes upon various physiological functions. Here we are dealing not with logical systems as such, but in relation to, and as aspects of, the organic system of behavior of which they are a part.

We must be careful not to confuse purely logical relations with energy relations. Bradley seems to do this when he insists that we cannot take facts over again in our logical experiments of analysis and synthesis without transmuting them. We do indeed transmute their significance in so experimenting with them. But their energy properties and relations are only transmuted, in so far as they are transmuted, in their energy systems. Colors do not change their tint or hue by our thinking about them. They do so only as a result of physical and physiological changes. On the other hand, we cannot treat the world of energies with its transmutations as a merely logical type of system, compounded of logical entities. While it is true that in our logical universe of discourse we can take our entities and relations over and over again in various contexts without affecting their character, we cannot postulate *a priori* that we can do so in the concrete world. In our energy systems we must discover just what difference it makes that our elements enter into different combinations, and must formulate our laws accordingly.

Things and Values[1]

The unique contribution which is made by the experience relation is the world of values. Values have their basis in the relation of objects, with their qualities, to the realization of the will. They involve two relatively independent variables — conative tendencies with their organization on the one hand, and feelings, with their physiological conditions, on the other hand. The latter are bound up with the much despised organic sensations of the vital organs below the diaphragm. The former imply, on the one hand, instinctive tendencies and, on the other, tendencies derived from the organization of instinct into social experience. Both variables are essential; but, of the two, organized tendency is the more constant and important, and tends to grow more so with the organization of experience. Feelings tend to fluctuate with organic conditions. They are especially prominent in the case of obstructed activity, and tend to approximate zero with the complete organization of activity. But the presence of feeling, or at least its possibility, must be regarded as an essential condition of value, for an activity which can no longer be felt can hardly be spoken of as realization or as a value activity.

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[1] For a fuller discussion see "Value and Social Interpretation," *The American Journal of Sociology*, 1915.

There has been considerable dispute as regards the qualities of values. Some have contended with Socrates in the "Protagoras" and with Bentham that there are only two kinds of values, pleasant and unpleasant, though these may vary indefinitely in quantity. Pleasantness and unpleasantness, however, must be regarded as the names of two fundamental classes of values rather than as an analysis of the qualities of values. If values depend, as we have maintained, upon the two variables of conative tendency and feeling, there must, owing to the variation and complexity of these variables, be an indefinite number of value qualities. This seems to agree with what we find in concrete experience, where we discriminate an indefinite number of classes of value, in accordance with the varying types of activities and emotional states.

The question naturally arises as to the relation of value qualities to other types of qualities, such as sense qualities. Some have suggested that value qualities should be called tertiary qualities. This assumes the distinction between primary and secondary sense qualities. This ranking, however, is purely pragmatic, as we have shown elsewhere. The so-called secondary qualities are just as real as the so-called primary qualities, though the latter may be more important for certain purposes. Nor can we admit the implication that value qualities are merely more subjective sense qualities. They are not sense qualities at all. They belong to a different system of reality. While sense qualities vary independently of our emotional-volitional situations, values vary precisely with the unique character of these situations. We may have passed from enthusiastic enjoyment of ragtime to utter boredom of that sort of thing, but the sense qualities of ragtime have not changed in the meantime. Again, the world of values grows with experience. Our reflection upon values is itself a source of values, but our reflection upon sense qualities does not alter their character.

While value qualities must not be confused with sense qualities, they are none the less real. They are indeed qualifications of the objective world. We cannot admit that they are mere arbitrary additions to our world, irrespective of its fundamental constitution. They are gifts in no other sense than sense qualities are gifts in their own unique systems. They are unique characteristics within certain relations, implying a specific type of organization. They are just as much a part of the real world under their own conditions as are the unique properties of water within their own special system. They may even be said to reveal the richness of the world to a greater degree than the sense qualities. They give us what may be called the inwardness of reality, — the sense of participation in activities as opposed to being a mere mechanical agent or a mere neutral spectator like the Sankyah soul.

Values permit of their own type of organization. It is not true that value qualities are merely private and fleeting. They are capable of comparison and agreement; they are socially predictable. And so we have our cookery, our science of economics, and our art, which would be impossible if values were of a merely unique, private, and irreversible character. They may, indeed, be more permanent than sense things. Our biological values have a high degree of uniformity in the development of the race. Even our æsthetic and ethical values show a considerable constancy. Greek art is still beautiful to us, and the ethical ideals of the Hebrew prophets are still standard for us. On the other hand, some of the chemical elements, like radium, would seem to be undergoing a radical change as regards their qualities. Indeed, the possibility of social structure — our mutual confidence on which credit is based, and our mutual appreciation on which friendship and art depend — presupposes a certain constancy and agreement as regards values. There are, no doubt, the more transient values which exist but for the moment. There is, too, the uniqueness which must go with individual organization and with the peculiar context of living, social experience of which we are a part. Our agreements and laws are, indeed, abstractions — nets in which we try to hold the concrete, real world. But this applies also to other types of qualitative selection. In any case it is the more stable and universal features which give significance to the more unique and fleeting ones.

Looked at from the point of view of the world of values, things become merely instrumental. They are the circumstances and accidents to be controlled and made over, the raw material for creative transformation. We cannot attribute value to things on their own account as we can to selves. The values of things are derived from their being taken up into the process of conscious realization. Agnosticism is quite right in maintaining that we cannot know the inwardness of things, but this is because they have no inwardness. Things have no halo of value on their own account. The values of things exist, as Hegel would say, *an sich*, and not *für sich;* that is, they exist for the spectator, and not for the things themselves. At least so it seems to us in our limited perspective. In the world of values, man and conscious wills like his are the measure of things.

Those idealists, who have made value the ultimate category of existence and who have insisted that only the intrinsically valuable is real, have been forced by their logic to deny reality to things as contrasted with values. Thus T. H. Green, having assumed that the universe is ultimately a unity of meaning, that the reality of things is constituted by reflective experience, and finding that nature cannot itself be regarded as such an experience, can give things a *locus* only in our own and the absolute experience. Plato, likewise, having assumed that only worth is real, is forced to accord to the world of perceptual things only a phenomenal reality. The real world becomes a world of normative ideals of which the concrete world is only a poor imitation. Nature can be acknowledged as real only as it is reduced to mathematical models. But while we must insist upon the reality of values in their own unique systems, we must also admit that things have qualities and relations of their own in other systems which we must acknowledge. It is indeed through the existence of such systems as the mechanical, chemical, and biological, that value realization is made possible, however much the existence of value systems enhances the retrospect and prospect. It is only fair to say, however, that the overemphasis of the idealist has been called forth by the understatement and skepticism of the materialist, and historically has constituted a compensation for the latter's depreciation of values. Nor has materialism of this sort been confined to a few philosophers. If so, it would be comparatively harmless, as but few can understand them. The eternal protest of the poets and prophets is rather against the materialistic deadness and commonplace which tends to overlay the dull routine of human society, and which makes us act as though merely things were real, and as though selves were mere things to be used accordingly. As against this general social tendency, we need the romantic movements which emphasize that, in human economy at least, things must be instrumental to values. This may also be true in the larger cosmic economy. We know that within human control, values may condition the survival of things. This happens whenever the will selects on the basis of ideals. Whether a statue shall survive as a statue depends upon its formal fitness rather than upon the properties of its material, which may be Parian marble. Whether a grove or a hill survives may depend upon its relation to human purposes. If there is a conscious power that exercises selection in the larger universe, then survival in the whole of existence as well as in the world of human control, may depend upon its value fitness — its harmony with an ideal constitution.

To us, indeed, natural beauty seems an accidental framing of the contexts of our environment. We limit nature arbitrarily, it seems, by our interest, and within those limits find an æsthetic value realized, as in a mountain or lake or woodland scene. In the case of artificial beauty, on the other hand, the will is able to create its own conditions. It can eliminate a great deal of detail and thus produce greater clearness and distinctness than the natural object usually has. But both artificial and natural beauty must suggest life and energy in harmonious interplay and equilibrium in order to fulfill the demands of the æsthetic instinct. Both depend, in the last analysis, upon formal laws which are forced upon our experience and which must somehow be inherent in the structure of reality. We are somehow, in the process of cosmic evolution, made for the sunset as well as the sunset for us. Nature but reveals through human nature its immanent tendency toward order and beauty. In the words of the Swedish poet, Runeberg: "Art does not raise nature and it does not make it more majestic than it really is, but it raises human nature to see its own glory and the glory of the world — it helps to see right through the confusion of the external."

PART II

CONSCIOUSNESS AND MIND

CHAPTER VII

THE CONCEPT OF CONSCIOUSNESS

Examination of Theories

THE question confronts us at the outset: what sort of reality can we assign to consciousness? Is it an energy or thing — another kind of thing, perhaps, from the world of things it illumines? Anaxagoras evidently felt after some entity which he could set over against the world of ordinary things. So he invented *Nous* 'infinite and self-ruled, mixed with nothing, the thinnest of all things and the purest; and it has all knowledge about everything and the greatest strength; and *Nous* has power over all things, over the whole revolution, so that it began to revolve in the beginning; and it set in order all things that were to be and that were; and all *Nous* is alike, both the greater and the smaller.' Strange attempt this to get away from the world of quantitative processes, but lacking the tools to do so; to find something which does not move and yet is the source of motion. This idea of something which is not movement and yet the source of movement has been stated recently, in modern terms, by the late Professor C. S. Minot: "The universe consists of force and consciousness. As consciousness by our hypothesis can initiate the change of the form of energy, it may be that without consciousness the universe would come to absolute rest."[1] But this ambiguous status of consciousness, as that which is and is not a thing, which does not move and yet is the source of movement, is not very consistent or satisfactory. We must locate consciousness in one category or the other, and to that end we must make our concepts more clear and definite. Ostwald frankly treats consciousness as a form of energy convertible into other energies. But his tools have not enabled him to deal with consciousness as such. What he has dealt with is physiological and psychological *processes*. Now I freely admit that we may look upon psychological processes as energetic. I can see nothing in the way of such a view except prejudice.

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[1] *Science*, N.S., Vol. XVI, No. 392, p. 26.

The insistence in recent times that mental processes are not quantitatively comparable is due to the confusing of processes with the consciousness of processes. The consciousness of blue or pain or effort is not a quantitative affair. But the processes themselves are, however crudely, quantitatively comparable. Wherever you can apply the category of more or less, you have quantity. There are intensive quantities, as well as extensive. That we cannot in the former case superimpose a quantitative unit does not prove that they do not differ in quantity. This is merely a matter of the exactness of the quantitative comparison. Fechner's mistake was not in regarding psychological processes as quantitative, but in trying to equate processes where quantitative *units* are possible with those where no such units are possible. It is no argument against the quantitative character of mental processes that they also differ qualitatively and that you cannot equate quantity and quality. Neither can you do so in chemistry. There, too, you have to recognize certain original elements as well as quantitative relations.

Now all psychological processes, be they sensational, affectional, intellectual or volitional, differ in intensity, as well as in kind. Bergson's attempt to reduce psychic intensity to a qualitative manifold is due to his reading the complexity of the physiological conditions into the psychological result. We must take the psychic process for what it appears to introspection, irrespective of the antecedents. The variation in intensity, moreover, bears definite and describable relations to physical and physiological conditions. Hence I see no reason why we should not use energy as a term for such differences. Pressures may be heavier or lighter without varying in kind. Colors may be brighter or fainter, pains may be intenser or weaker, memories may last longer or shorter, ideas may be more or less vivid, the feeling of effort may vary in strength. Whereever you can vary as regards more or less, without variation in quality, there you have quantity. What else would you call it? Whether there is also in such cases variation in the quality of the psychological processes, introspection must decide. There is no other judge. This difference in intensity must not be confused with our spreading out our qualitative series, such as our color series, in space in order to schematize the qualitative relations. Though our figure here is spatial, that does not make the relations quantitative. Distance here is merely figurative for the direction of difference of quality.

What I have said in regard to perceptual contents, I might have said in regard to will. Will or desire is capable of being more or less, even if we cannot measure it with exactness. All psychological processes are conative processes. They involve motor tendency and this varies in strength. The mistake has not been in regarding conative tendencies or motives as differing in strength, but in regarding them as forces independent of the ego and acting upon the ego. Whether will, or conative tendency, which lies at the bottom of all psychic processes, is an energy different from electrical and nervous energy; how it interacts with other forms; whether it is radioactive or has some still subtler mode of making a difference; whether it acts at a distance, — this would have to be dealt with in a discussion on energy and not on consciousness. At present I am inclined to think that mind-stuff is a distinctive type of energy, however ignorant we may be of its relation to other energies. Moreover, it seems evident that conative tendency is not always, and therefore need not be, conscious tendency, and that mind stuff and consciousness do not necessarily coincide. Whether, again, all energy can be reduced to one kind and whether will is that fundamental kind, is a question to be decided by scientific convenience and quite distinct from the problem of consciousness.

While we must acknowledge, then, that conscious *processes* are more or less, that they have describable relations or continuities with other processes, such as physiological and chemical, and that therefore we may extend the term energy to cover these, we cannot on that account admit that consciousness as such is capable of more or less, any more than of qualitative difference. Is the consciousness of extended or heavy or colored things an extended or heavy or colored consciousness? Is the consciousness of a greater intensity a more intense consciousness than the consciousness of a less intensity? I see no need for assuming a difference in consciousness. The variations in kind and in intensity can all be accounted for as due to variations in the complexity and intensity of the processes, conditioned by the cortex in the last analysis. There is no need in duplicating these differences on the side of consciousness. It is easier to suppose consciousness a constant and regard the variations as due to physiological and conative processes than to duplicate the processes by making consciousness an energy. But if the fact of consciousness does not vary, either as regards quantity or quality, with the variation of energetic processes, then we may be sure that it is not itself an energy or a function of energy, but must be treated as an independent dimension of reality. All our scientific evidence, introspective, biological, and pathological fits in with this view. It is with the complexity of biological structure that consciousness has come into evidence; and the differentiation of conscious processes in the way of sensations, memory, reasoning, has followed the growth in complexity of biological structure. And, again, with fatigue, disease and degeneracy of such structures, the complex psychical processes fail to operate. When we are tired, we fail to recall a familiar name, though we are conscious enough at the time. Disease may make us lose our visual and auditory images, may make us fail to think coherently, and to regulate our activities in a purposive and orderly way, though we are as conscious as ever. The energy and organization of conscious processes, therefore, cannot be found on the side of consciousness.

Moreover, however much continuity there may be on the side of the energetic conditions of consciousness, consciousness as an effective factor no doubt appears at a leap — as sensations of light when the structural conditions of the eye are complete, or of tone with the presence of the basilar membrane, or of electricity when the proper motion or chemical conditions are furnished, with the difference that, while in the above cases the relations are energetic, the energies varying in some quantitative proportion, in the case of consciousness the category of energy is not applicable.

Theories which try to define consciousness in terms of energy must somehow surreptitiously add consciousness at some stage of the process. They cannot derive it from energy. It is not clear that the energetic equivalences are in any wise affected by consciousness being added. The adding of the fact of consciousness is sometimes concealed by using the term potential which covers so many sins. Certain energetic situations are potentially conscious only on condition that you add consciousness. Certain optical processes of light waves, retinal and cerebral changes are *sensations* of light only when you add consciousness to the situation. In the same way, certain dynamic *tensions* in connection with the brain are not as such consciousness. This must be added in order for processes to be aware of themselves as association and meaning.

It has become the fashion now to state consciounsess in terms of empirical situations of experience rather than in terms of a thing or energy outside experience. Here, again, there has been difference of emphasis. What part of the experience situation is it that is identical with consciousness?

The older writers on psychology were wont to identify consciousness with the sum total of experience. They made a catalogue of its various contents — sensations, memories, concepts, feelings, and volitions, and called the whole consciousness. What mental processes are when they are not conscious they did not try to explain, unless indeed they fell back upon a materialistic physiology, or more recently upon the vague notion of the subconscious which is left undefined. It has seemed, however, to some recent psychologists that consciousness must be defined in terms of some part of the psychological situation, rather than in terms of the situation as a whole.

One group of writers would identify consciousness with the motor aspect of the psychological situation. It has been pointed out that the motor sensations occupy a peculiarly prominent place in attention. Some would even go so far as to reduce mental activity altogether to kinæsthetic sensations and images. At any rate such were the only facts which Wm. James could introspectively verify. It has been shown by the Dewey school[1] that strain, doubt, and readjustment are conditions of consciousness and that, when those are wanting, consciousness drops out. It has, therefore, seemed that consciousness must be identified with certain organic checks and releases in the realization of the vital impulse. Stated in more general terms, the unique function of consciousness is to control behavior.[1]

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[1] See "James Memorial Volume," Longman's, pp. 73 f; also E. B. McGilvary, Discussion, the *Jour. Phil. Psych. and Sci. Meth.*, Vol. IX, pp. 301, 302, and Dewey's Reply, *Ibid.*, 544–548.

The elements in the psychological situation, emphasized by the motor theory, are no doubt significant for the understanding of consciousness. But I do not believe they afford a final explanation. In the first place, the motor sensations and motor attitudes are merely symptomatic of the system of conative tendency which presses for realization. At most they are only part of the content of the situation. The more organized the conative tendency is, the less noticeable are the motor sensations, and the more important is the part which the intellectual elements play in the organization or steering of the stream of impulse. While again it is true that "consciousness plays about the zone of activity" (to use Bergson's picturesque phrase), or rather serves to reveal it and show its whither, we must not confuse the conditions of consciousness with the fact itself. Because consciousness appears under certain conditions of intensity and strain, it does not follow that consciousness itself can be reduced to terms of such intensity. It seems, on the contrary, to be a new fact, discontinuous with the antecedent conditions.

Another group of writers would identify consciousness with the cognitive side — the relational aspect. This theory is an implication of the idealistic movement. Since the relations are taken as existing within the content rather than as legislated from without, the theory harks back to Hegel and T. H. Green rather than to Kant. In any case it is the relational aspect which is regarded as giving the contents meaning. The relations which are emphasized by a contemporary author are the logical relations. Consciousness is identified with the concept of *cognitive meaning*. To quote Professor F. J. E. Woodbridge: "We are wont to think of a world without consciousness in it as a world devoid of meaning. Add consciousness to that world and then meaning is added, but nothing else. . . . Indeed, it seems to me, on analysis of the situation, that just this character of 'awareness' turns out to be the manifold and irresistible meaning connections which the things in the conscious situation have."[1] And again: "The peculiar way in which consciousness connects the objects in it is, thus, the way of knowledge, actual or possible."[2]

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[1] It is impossible here to do justice to the functional view of consciousness. It has found classic expression in "Studies in Logical Theory" by Dewey and other members of the Chicago School. See also the lucid statement in "Pragmatism and its Critics," by A. W. Moore; "Definition of the Psychical," by G. H. Mead, University of Chicago, Decennial Publications, First Series, Vol. III, Pt. II, pp. 79–112; Angell's "Psychology." B. H. Bode identifies consciousness with the "fringe" considered as a total character, "which is in the nature of a reference or relationship that faces the future," but the function is control. *Phil. Rev.*, Vol. 23, pp. 389–409. While the functional theory has made an important contribution in showing the part played by conscious processes in prevision and adjustment, it does not define consciousness as such.

In the first place, the attempt to define consciousness in terms of cognitive meaning or logical relations seems too narrow a definition. There are other types of meaning beside the relational type. There is the cumulative perceptual disposition as in listening to a melody or in the immediate sense of duration as conditioned by attention strain. There are also the æsthetic and mystical types of meaning which, while they possess a certain noëtic value, cannot be regarded as relational in the logical sense. Moreover, there may be types of experience of a more primitive character to which we cannot ascribe the category of meaning. Hypothetically at least, we must assume a first interest, a pure perception, which is innocent of any associative context. In everyday life we are conscious of a vast number of sensations which we do not attend to and which, therefore, have no meaning. Shall we read out these other types of meaning or these mere "awarenesses" from the category of consciousness, when we *are* conscious of them? That seems at least arbitrary.

Is, however, the main thesis true that by adding consciousness we add meaning? And conversely, that by taking away consciousness we take away meaning? Do we add the meaning to Homer's Iliad or to Euclid's Geometry or to our own meditations of yesterday by becoming conscious of them? Do they not as a matter of fact have their own relational context, quite irrespective of our awareness, — a meaning which is socially objective and which we must respect? It would seem, then, that the world of cognitive and other types of meaning into which the objects of the world have been woven are as independent of consciousness as are their spatial and temporal contexts. Consciousness no more creates the former type of context than it does the latter.

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[1] "Studies in Philosophy and Psychology," 1906, pp. 160 and 161. Cp. R. B. Perry, "Conceptions and Misconceptions of Consciousness," *Psychol. Rev.*, Vol. 77, esp. p. 296.

[2] *Jour. Phil. Psychol. and Sci. Meth.*, Vol. II, p. 122. Professor E. B. McGilvary regards consciousness as "a unique togetherness" not further analyzable. See "Experience as Pure and Consciousness as Meaning," the *Jour. Phil. Psychol. and Sci. Meth.*, Vol. VIII, pp. 511 ff.

It may be argued, perhaps, that, while the objective or social meaning is thus independent of our awareness the subjective way of taking or apperceiving these meanings is identical with consciousness. This is nearer the truth at any rate. But even in taking account of my own present meaning and its implications, I must recognize that it is not created by my awareness, though this awareness is a condition of the meaning's intuiting itself. In the deliberative process, for example, the will discovers its trend, the implications in its push of tendency, in its system of relations. But this direction and complexity of will do not originate when, in the stress of readjustment to a new situation, we become conscious of their implied meaning. Neither the conative system nor the perplexing situation are created by consciousness. The awareness is added as a new fact — a gift from the larger universe to the energetic situation. It does not create the personal, any more than the social meaning. In either case it is a condition for *intuiting* or lighting up such meaning with its inherent relationships.

If what is intended (and the advocates of the relational view of consciousness shift easily and without warning from epistemological to physiological terminology) is not that consciousness is a relation between terms figuring somehow within the field of experience, but that it is a type of interaction between energetic centers, a type of energetic continuity between energy as nervous structure and energy as stimulus,[1] then we shall have to ask how it figures or what difference it makes to this interaction. If this interaction is an interaction of non-conscious energies, how can it account for the presence of consciousness? The fact that it appears under certain energetic conditions of structure and stimulus does not prove that it is nothing else than the interaction of structure and stimulus, if you choose to use relation in this extraconscious sense. I cannot distinguish this miraculous production of consciousness, out of non-conscious energies, from the materialistic position, which I shall discuss later.

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[1] W. P. Montague identifies "the field of consciousness with the field of potential energy set up in the nerve centers," the self being conceived "as a system of interconnected stresses." The *Jour. Phil. Psychol. and Sci. Meth.*, Vol. V, p. 210.

What would seem to be indicated, then, is that consciousness is a fact over and beyond relations, whether logical relations or energetic relations — a fact which is somehow bound up with the subjective significance of relations; which makes energy aware of itself as meaningful energy. Just as space is not a relation or a system of relations, but makes possible the whole system of distance interactions, schematized by our constructive purpose into a system of relations; and as time is not a relation, but makes possible the relations of before and after, of past, present, and future, so consciousness, though not a relation, makes possible all *significance* of relations including time and space relations, as well as logical relations. Just as in the case of space, it is not a question of a relation to space, but a question of the relation of energies to each other as conditioned by space, so in the case of consciousness it is not a question of the relation of facts or energies to consciousness, but the relation of these facts or energies to each other within the field of consciousness. Consciousness is added to a certain type of energetic relation, where conative constitution is a factor of the energetic system. Just as certain substances such as mother of pearl have no color of their own, but are colored by the variegated light which plays upon them, so consciousness can claim no quality or relation as its own. It merely brings to light the variety of the context. If we take consciousness as such a neutral light, we are free to account for process and its qualities in terms of the energetic situations. Tone, color, and pain, we then find, are as much processes as weight or chemical change. What consciousness adds is the awareness, which is something over and above the energetic relations.

If consciousness is not a relation, nor a thing, nor a form of energy, shall we accept the nominalist view that consciousness is merely a name for the sum total of conscious processes, and that any attempt to deal with consciousness as such is a mere hypostasis — a mistaking of a logical abstraction for an independent reality? Is it like abstracting somniferousness from somniferous substances and then treating it as an independent fact? Is it nothing over and beyond certain processes?

There is surely enough truth in the nominalist view to make it plausible. We have seen by this time that consciousness cannot be a thing; that, therefore, if you abstract from the processes in connection with which consciousness appears, there is no *thing* left. But is there not something suspicious about this introspective method and its easy solution? Does it not include first of all the fact which it was to separate, and then say that it is not outside? It is true that outside of conscious processes introspection furnishes no evidence of consciousness. But why should it? Neither does chemistry furnish any evidence of water or radium outside of the things known to contain water or radium. If you wanted arguments for the presence of consciousness outside of empirical conscious processes, you surely would not get them from introspection.

But the problem has not been stated fairly by the introspectionist. The ego is not statable merely as a stream of conscious processes. The ego is an affair of dispositions or tendencies, sometimes conscious, sometimes not. Consciousness surely does not make the stream of life continuous. The tendencies in the way of association and memory are present, sleeping or waking, else they would be of no use. Meaning is a matter of the working of the associative mechanism, and this is recognized as a physiological fact. What makes a fact suggestive at any one time, or what makes culture, is only to a small extent conscious. Even when adaptations are conscious for a while they may become habits. What becomes of consciousness when it is "not needed"? The question is not: can you observe consciousness outside of conscious processes? Can you, like the old schoolmaster, see some boys that are not here? That is to talk nonsense. The question is: what significance does this fact of consciousness have in the stream of the ego-tendencies, where it is sometimes present, sometimes seemingly absent or absent so far as effective relation to the processes goes; which at most only partly, and in small part, illumines our fund of tendencies even when we are most awake? In short, what makes the difference between sleeping and waking? What happens when we *become* conscious? During sleep we are still there to other observers. We are energetic activities which can become conscious in an instant, by waking up. In the meantime there is no evidence to others of consciousness. A little change in blood distribution and heat, perhaps, or it may be only an external stimulus of some intensity, furnishes the condition for the reappearance of consciousness, and the wheels of mind go round again in a significant way. The world has value once more. With the increased working of the extra-conscious machinery of association, we pass thus from sleeping to dim drowsiness and to organized waking meaning. The conscious moments seem discontinuous. In the stream of tendencies which we call the ego, there are beside the conscious moments, the changes which the purposive ego and the spectators must *interpolate* in order to understand the conscious processes. If it were not for this seeming coming and going of consciousness as contrasted with the continuity of the energetic processes, on which our feeling of continuity itself depends, we would not abstract consciousness — but what does it all mean?

The materialist is ready with a simple and at first sight plausible answer. He at least tries to meet the problem of seeming discontinuity in nature. His answer is that consciousness is a discontinuous function or incidental effect of the mechanical processes. He includes not only consciousness as such in this "epiphenomenon," but all conscious processes. These, moreover, are not energy, but a picturesque chiaroscuro or halo of the going-on of the energetic processes, which are mechanically conceived. Or, stating it more crassly, but not less metaphorically, "the brain secretes thought as the liver secretes bile." Or, if you want more metaphors, consciousness is to the physiological mechanism what the headlight is to the steam engine.

But while metaphors have always appealed to human beings, they are not very satisfactory as explanation. The conception of energy for one thing has changed, and the materialist, familiar with the physical speculations of to-day, would be more apt to use electrical than mechanical metaphors. That, however, would not essentially alter the problem. We have also seen that conative processes, whether conscious or not, must be thought of as energy. They vary as regards quantity; they bear definite relations to other forms of energy. We shall have to transfer these, therefore, to the energetic side of the account. Nor is it any argument against these processes that they are different from other forms of energy, that some of them at least are not extended, that they cannot be weighed, and that, therefore, the category of mechanical motion is not applicable. Electrical energy and neural energy do not have extensive mass or weight; they do not come under mechanical motion; yet we have to recognize them as forms of energy, and as making definite differences to other forms. We need have no difficulty, therefore, in recognizing mind stuff as energy. And why should certain processes cease to be energy because illumined by consciousness, any more than space, though not active, prevents bodies from being active, though activity has a very different value, and scope, too, no doubt, because conscious?

The common objection, raised against materialism, that it violates the law of conservation of energy, would not be serious if the theory met the facts, as scientific laws are mere generalizations from facts. It would at most only show the limitations of the so called law. Neither is it an answer to materialism to charge it with moral baseness, as our ideals are what they are on any theory. And sometimes sad things are true. Our only concern now is, does it explain the presence of consciousness? We would have to agree with materialism that consciousness as such is not an energy, and hence cannot do what energies do, even though we must recognize conscious *processes* as energy. Consciousness is not capable of quantitative variation. It cannot be the cause of motion and change. But can we regard it as an effect of energy? We are familiar now with all sorts of transformations of energy. We know that mechanical motion can bring about electricity or heat, so different from itself. But can we also conceive of energetic process producing a fact which is not energy at all — not transformable into energy, to be sure, because it is a different sort of fact, but can it, not being energy, be caused by energy? There is an unbridgable *saltus* here in the thinking of materialism; and none have been more candid in admitting this than some of the materialists themselves.

I do not see, however, that the *saltus* is any greater in making a non-energetic consciousness the effect of energetic changes than in recognizing, as James and Minot do, that consciousness is not a thing or energy, and yet make it produce energetic changes. The chasm is about as wide one way as the other. That one form of energy can bring about changes in another form of energy is within experience and probability, but not that energy should be converted into non-energy, or *vice versa.*

If materialism holds with Hobbes that consciousness is a property of matter and not a miracle merely, it must also admit that it is totally different in kind from any other properties. It thus practically admits that consciousness is an independent variable or attribute of reality.

Any theory, whatever it calls itself, which strives to derive consciousness, will have the difficulty of materialism — in losing the quantitative and energetic in what is not energetic. This involves an unintelligible *saltus;* and we shall always, therefore, look for a smoother transition between consciousness, on the one hand, and the world of processes, with their quantitative variations, on the other. This is furnished in the theory of consciousness as a constant in the universe, though depending upon certain conditions for its manifestation, as electricity is now regarded as an original fact (by some the most original), though dependent upon certain conditions. This brings it into the realm of the familiar.

Materialism has at least the advantage of simplicity, but parallelism is as cumbrous as it is unintelligible. To remedy the fancied injury to the law of the conservation of energy, it duplicates physiological and psychological processes and leaves them suspended in mid-air, without either series making any difference to the other. To speak of psychological contents, where there is no evidence, is surely doubtful psychology, and, so far as I can see, has no epistemological justification. To wind up with idealistic monism is as roundabout as it is a questionable way of arriving at such a doctrine. To make psychological processes parallel to mechanical rearrangements can only convey sense to a man who does not think about it. Even if we mean by parallel merely a one to one correspondence, we have no right to assume *a priori* that such obtains. And it would be the wildest sort of imagination to hope to establish it by empirical proof. And, lastly, to give the world of physical objects any status at all, since it can make no difference to the world of psychic processes, seems impossible. If this furnishes credulous people a short cut to idealism, let them enjoy it.

We have already seen that psychological processes must be regarded as energy, bearing statable relations to other forms of energy. The physiological body is a net for catching several types of energy, mechanical, chemical, electrical, nervous, and conative. There is no reason for drawing any line of holy and unholy between these, at least for scientific purposes, and together they furnish the individual organism with its race and individual characteristics, its continuities, and its specific activities. To this stream of processes consciousness is somehow added. But it is certainly not parallel to it.

There remains the interaction theory, with its insistence upon the causal efficacy of consciousness. With the best of motives, this theory is as confused epistemologically as the preceding. There can be no sense in speaking of the consciousness of pain or blue as interacting with the physiological processes of pain or blue. The pain processes and the blue processes, no doubt, vary with other energies, and in turn act upon them, but this is not the case with the *awareness* of them. By stating consciousness as an independent variable, an ultimate, non-energetic fact, we shall have the simplicity of materialism without the contradiction of trying to convert energy into non-energy. We shall fulfill the intent of the materialist by taking consciousness out of the energetic category, while we acknowledge the energetic claims of the conative processes. We shall save the duplication of parallelism and its absurd separation of processes into two independent causal series, but we shall accomplish the intent of parallelism by showing the independent and non-derivable character of consciousness as such. We shall finally accomplish the intent of the interaction theory by showing the energetic character of the conative processes, their efficacious relation to the other energies of nature, while we get rid of the absurdity of having a non-energetic consciousness interact with an energetic world.

It is time we were getting over the false prejudice that the body is something mean and base and that activity is being degraded by being called physiological. The Greeks did not look upon the body as anything degraded. On the contrary, it was to them the embodiment of beauty and meaning. It furnished the inspiration for Greek sculpture. It is fraught with the potentialities of life. Plato alone, in some of his pessimistic moods, makes the body a prison house. Aristotle is here the truer Greek. For the evolutionist, the body is the bearer of the tendencies, the biological heritage, of the race; and for the psychologist it must furnish continuity and meaning to life through habit and memory. Mean is what mean does, and good is what good does, and if the body is bound up with all our badness, it also is bound up with all our goodness and appreciation of beauty; it makes us one with the world of energies, at the same time that with its tendencies it differentiates those energies for us. All it needs is consciousness to convert this structure, when it has reached a certain complexity, into actual value. And it does not, like Prakriti, vanish at the glance of Purusha. But it furnishes the activity still, though meaningful activity. And so we fail to give it credit. The body is the organ and the music, too, as consciousness is added to the complex bodily energies. The ceaseless, untiring player is nature, which in us becomes purpose and ideals. It is a mistake to identify the body merely with the physical and chemical forms of energy. It includes nervous and will energy as well. There is ample chance for a hierarchy of energies within the body — the bearer not only of the past and present, but pregnant also with the future.

Consciousness and Mind Stuff

This theory of consciousness removes the greatest obstacle to the proper metaphysical understanding of mental processes, *viz.* the dogma that their existence depends upon our consciousness of them. There are two conceptions of the existence of mental processes when we are not conscious of them which may be regarded as typical. One is Augustine's view that ideas exist in a mysterious storehouse of the mind, thence to be dragged forth under certain circumstances. The other view is that mental facts exist only when we are aware of them. This has been expressed recently by William James: "The *percipi* in these originals of experience is the *esse;* the curtain is the picture."[1] It is one of the ironies of history that nothing has played into the hands of the materialist as this doctrine of subjective idealism, that *esse est percipi*, when applied to our mental states. If we assume that our mental processes cannot exist unless we are aware of them, then we must assume likewise that when we are not thus conscious, mental facts are converted into material processes; and thus we have an infinite number of miracles — magic transformations from the material into the mental and *vice versa*, unless indeed we assume with materialism that the halo of mental facts is extinguished altogether without any energetic equivalent — to be created afresh under certain conditions, as Heraclitus' sun is extinguished and born from the sea. How such a somersault theory should have been tolerated as scientific it is difficult to see. It certainly indicates a tremendous appetite for the miraculous.

Since subjective idealism assumes that mental processes exist only in a field of consciousness, it follows that mental processes must be *witnessed* in order not to pass into nothingness. Moreover, since subjective idealism likewise assumes that physical qualities exist only as mental states, nature too must be witnessed in order to exist. It is true that such witnessing need not be by you or me or any particular finite self, but by a more inclusive witness. Even so it would seem to follow that my individual reality and yours disappears when there is no individual witnessing, though held perhaps, in the meantime, as a configuration of content in the consciousness of some other witness. What constitutes the real significance of subjective idealism is that processes and relations in order to exist must be witnessed. Historically it has never meant solipsism, as there has always been the assumption, tacit or explicit, of other witnesses beside the individual moment. It was taken for granted even by Berkeley that the universe did not vanish, when he as an individual happened to nod. In fact its character need not be altered so long as there is *any* witness.

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[1] "A Pluralistic Universe," p. 378.

The attempt to define the witnessing has given rise to a diversity of opinion. Some have argued that since reality does not seem to be dependent upon your or my witnessing, there must be an absolute witness, which includes all finite contents of experience in one comprehensive and eternal field of consciousness. Our fleeting moments are but fragmentary flashes of this complete self-consciousness. And whatever reality we have, we therefore eternally hold within, and by virtue of, the absolute. Others, again, have insisted that plural finite witnesses, sharing the same contents, are sufficient. The reservoir may be a larger cosmic field such as Fechner's earth-soul, or a finite supernatural mind which envelops us. Such plural witnesses it is felt are sufficient to guarantee the reality and meaning of our evanescent contexts of experience.

In either form, the theory of subjective idealism is a dogma unsupported by evidence. It rests on the fallacious use of the method of agreement which merely emphasizes that mental states exist when we do take account of them. This no one would dispute. That they also make a difference when we do not take account of them, — a difference to the significance and control of the content when later attended to or to the sequence of events in consciousness, — is now a commonplace of psychology. It is a gratuitous assumption to suppose that mental processes are created and vanish with the appearance and vanishing of the consciousness of them. Memories are certainly not created when we become aware of them. Association has its own conative context which is not a context of atoms and molecules. Tendencies, which we cannot recall, make a difference to the meaning and value of facts which we do recall. The shifting of the attention, which makes a marginal fact focal, does not make the fact. In the perception of things, and in the filmy texture of the imagination, we have the reinstatement of the original sensory elements, which must, therefore, have existed in the meantime. In short, we have come to accept the fact now that mind is a much broader term than consciousness; and that, while consciousness comes and goes, our conative attitudes, our cognitive and æsthetic contexts remain fairly permanent. It is easier, at least, to think that the limits of mind are not the limits of attention or awareness; that will attitudes and ideas do not cease when we attend to them — to be magically recreated upon occasion; that in the meantime they make a real difference to the total attention situation; that they are simply brought into the narrow field of attention by the machinery of association, and the determinate interest at the time; that like other energies they obey definite laws of spreading and recurrence; but that they become conscious facts only under certain conditions of intensity and organization. Their value for the cognitive moment arises when they become conscious, but not their own existence or meaning. Augustine, with his storehouse of ideas, is nearer the truth than subjective idealism with its perpetual miracles, for he at least does not establish leaps which nature does not know.

What I have tried to make clear is that consciousness and mind are conceptually separable facts, that consciousness is a fact superadded upon the contents of mind and their relations, under certain energy conditions of complexity and intensity; and that this consciousness when so added, does not *make* the will attitudes or perceptual contents nor does it add the *relations* of meaning to the contents. We no more make our own mind than the mind of Homer in becoming conscious of it.

This question is quite distinct from the question as to the relation between mental processes and physical processes. Having abstracted from consciousness, we can conceive our mental processes as energies linked with other types of energy in a definite way. If our conative attitudes seem to make a difference to physiological states and in turn the latter to the former, what is there, aside from our own bigotry, to prevent the applying of our categories of causality and energy, however difficult may be the exact measurement of the complex differences? All that causality means, in our ignorance, is that one set of processes make predictable differences to another set. And if electricity can make definite differences to extended and ponderable processes without being extended and ponderable, why should not mind produce differences in what we call physical energies, though the differences thus produced may not be identical in kind with their antecedents? Such differences at any rate the facts seem to indicate in the invariable sequences which we observe between mental and physical processes. This theory judges the existence of mental energies, as it does radioactive, from the behavior of the processes with which we deal. It holds that the conative system of tendency, bound up somehow for the time being with the cerebral context as its instrument or organ, is the immediate condition of consciousness. It is this which must be brought into play either in solving its own ideal problems or as the result of the shock brought by other energies, intra- or extra-organic. In any case, as the fact of consciousness is present throughout the whole field of introspective experience, we do well to take it for granted in dealing with the psychology of the self, with its continuities and discontinuities. The nature of consciousness is a metaphysical rather than a psychological problem.

CHAPTER VIII

THE CONCEPT OF CONSCIOUSNESS (*Continued*)

IF consciousness makes no causal difference to our energetic processes, if the complexity of the associative organization, as well as the nature of its constituent processes, the sensations and ideas, depend upon development and structure, what practical difference can consciousness make to our world? In the first place, we have seen that this is really a new problem. What has been dealt with in the past, from Protagoras, Augustine, and Descartes down, has been rather the contrast between one set of processes, the conative processes, especially as involved in knowledge, and the processes which seem more external to the conscious ego. But if you take away from the side of consciousness all that is energetic, is it not an abstraction? Yes, it is an abstraction in the sense that space is an abstraction, but like space it must be treated as a fact of its own kind. We have become acquainted with other realities, which, while they are not energy and therefore can make no causal difference to energetic centers, yet do make a definable difference. We must rid ourselves of the prejudice that energetic or causal difference is the only difference which facts within reality can make to each other. There are differences which do not involve quantitative equivalence, but which are equally real. Space bears no causal relation to the energies in space, and yet it makes a decided difference to these energies that they must interact in space. Their actions do vary in a certain statable way with the distance. Time I have identified elsewhere with the chance element of the universe. Time makes the difference of fluency or change at all. To what degree and of what kind the fluency shall be, depends upon the structural character of reality. Hence, in trying to describe the constancies or anticipations, which are based upon structure, even in reducing the flow of process in general to a conventional statement in terms of some one process, we may come to overlook the presupposition which makes process at all possible. The space character and the time character each makes only one effective difference and throws upon the energetic structure the responsibility for the diversity of facts and changes.

The Pragmatic Difference of Consciousness

So with consciousness: it makes only one difference to reality. Under certain energetic conditions, it makes the difference of awareness. You might say that it is physiological and conative processes which make consciousness apparent, rather than the opposite. For nature must first perfect her arrangements before consciousness can make any apparent difference. And this apparent difference *is* the difference of awareness. What the awareness means, what character and value it has, depends upon the energetic relations, always including the conative system of tendencies as part of the situation. The processes color consciousness, not consciousness the processes. Consciousness itself is colorless. A certain kind of energetic differentiation and a certain degree of energetic intensity become *sensations* of color or tone, etc., when we are aware of them; certain constructive or destructive changes become pleasure or pain. A certain kind of associative or cumulative structure becomes imaginative perspective, etc.

The usefulness of such a consciousness does not account for its existence, but we can see how consciousness, being real, can figure as a survival condition and how the type of structure, which makes awareness possible, should be advantageous. A more efficient type of adjustment is made possible by working in the light rather than in the dark. The structures favor consciousness and in turn consciousness favors the structures. Adaptation as such is not a matter of consciousness, as complicated adaptation does go on, both in human and infrahuman life, without consciousness. But, with consciousness, automatic adaptation becomes desire and purpose. Imagination and thought are added to reflex and instinctive reactions, with greater complexity of structure. It "is the light which lighteth every man that cometh into the world," but whether it is color or tone, emotion or thinking, pleasure or pain, depends not upon it, but upon the energetic conditions. As space is the precondition of externality and time of change, so consciousness is the precondition of awareness.

What metaphysical difference does this awareness make to our world? In what way is reality practically enriched or altered because of consciousness? We can conceive the energetic situations as the same though consciousness is subtracted. We have also seen that the contexts of meaning, past and present, logical and æsthetic, can exist without consciousness. They must be acknowledged by the conscious moment. They are not created by our awareness. What is added then to the conative situation by consciousness? And what disappears with the subtracting of consciousness? It seems clear that without consciousness, we could not have value in the sense of subjective significance. There could not be the sense of satisfaction in the working out of the conative tendency. In a non-conscious world we can conceive of a progress from a lesser to a greater perfection in Spinoza's sense of greater organization, more complete independence from external accidents, greater coherence of parts, until a self-sufficient, self-dependent whole is reached. But Spinoza is quite right that in such an impersonal constitution there could be no value — no sense of goodness and beauty. In an intellectual type of impersonal world, we would have a logic machine grinding out certain results. In a material type of world there could still be selective action, a differential taking account of stimuli, as the magnet takes account of the loadstone, as the chemical elements take account of each other in the compound, and respond by new creative syntheses. But the intuition of movement, the relations of cognition and appreciation, would be lacking, for these imply, beside the energy situations, the attribute of consciousness. The category of work, energetic interlocking, could be applied but not the category of realization. Conative tendency could be there, and this could go off in the presence of certain stimuli, as is the case with the physiological reflexes. Add consciousness and instinct becomes impulse, conative tendency becomes *interest*, with its tone of agreeableness or disagreeable-ness according to its success or failure. As the ghosts of Hades crowd to taste the blood of the sacrifices, so do the pale memories and tendencies crowd to get the vitalizing touch of a living interest. Thus is the halo of value added to what otherwise would be a mechanical and blind process. The specific coloring of the concrete values is still due to the processes — their direction and complexity. What consciousness makes possible is value at all. Homer's Iliad and Euclid's Geometry have meaning connections, but value they have only as they figure in the subjective moment, as taken account of by a living interest.

The relation of interest is a dual relation. It requires two terms for its statement, however immediate the situation may be, and whether we take account of their existence or not. It is consciousness which is simple, which knows no terms. Interest requires a conative constitution, on the one hand, and it implies the shock of a stimulus, on the other hand. It is futile to try to state the situation of interest in the absence of the conative tendency. It would be Hamlet with Hamlet left out.

The logical relation of knower and known is but one type of the conscious situation which we call interest. There is the relation of appreciation as well as of cognition. Within this field of interest, subject and object are locked in one selective reaction; they are functions of one context of experience, the subject indicating the organized conative system, the *referent*, while the object indicates the content selected or emphasized, the *relatum* — the whole situation being lit up, but not created by consciousness.

Consciousness thus makes the difference between automatic and significant activity. Without consciousness we could have the ether waves and the retinal changes and the complex cortical changes with complex adjustments, as in somnambulism. Certain destructive organic changes might be going on, but they could only be corrected, perhaps, by the extinction of the particular individual and the building up of race instincts, which is a costly and clumsy method at best. With consciousness, an infinitely greater degree of individual adjustment becomes possible because of the awareness of the changes.

The cumulative changes, made possible by a nervous system, become cumulative meaning. Physiological structures become pictures, and energetic interactions become significant relations. Thus past sensations and thinking become available for present emergencies, making it possible for prospective conative tendency to anticipate the future in a definite way, and thus enabling us to act at a distance in space and in time, instead of being dependent upon the present stimulus. Habit, association, and memory are still physiological processes and obey mechanical laws. It is their significance which has been altered.

Consciousness thus makes the difference to the stream of instinctive tendencies, that it can see its own flow, can become aware of its own direction, and can feel the value of its fulfillment or thwarting; and, as it does so, can control its separate impulses accordingly. It is not a link in the chain of causality, interacting with the events, physical or mental, but by its presence in the conative stream, the distinguishing of physical and mental becomes possible. The whole flow of change is transformed from mechanical causality to teleological causality. It is more like a medium, in which the events travel, than like a cause. It is not an epiphenomenon in the sense that it is a by-product of mechanical changes. Rather, it is a fact over and beyond the mechanical changes, which, under certain conditions, makes them more than mechanical. It makes the trend of conative tendency an ego.

We have seen that it is peculiarly in value situations that the presence of consciousness is significant. These, indeed, could not exist without consciousness. But we must not suppose on that account that value is created by consciousness. The latter is but one factor in the situation, however indispensable. In order to have value, there must be the fulfillment of organized tendency in terms of its object. This presupposes not only conative tendency, but the whole physiological machinery of associative organization. It has been pointed out by James, Dewey, Schiller, and others that values are creative additions to our world. But it is not our awareness that creates them. Little is known of the conditions of creativeness whether as regards appreciation or thought. We know that a certain set or attitude is necessary on the part of the will. Then we must experiment within our material whether artistic or logical. And if we work and meditate, something may happen. A new insight may come. But ideal creative conception, like biological conception, takes place in the dark. It is a gift from the creative energy of the universe. The light of consciousness but makes it appear to the individual and society. While consciousness, however, does not create value, it is equally clear that value could not exist without it. Value implies appreciation, the sense of realization, and this must be a conscious process.

While we have found the contribution of consciousness peculiarly significant in the case of value, we must not assume that value situations are the only ones in which consciousness exists as an ingredient. We would all agree that wherever there is attention there is consciousness. Now the selective character of attention, its contribution of clearness,[1] depends upon organization. In the case of primary and active attention, the affective quality is apt to be strong. There is a vivid consciousness of success and failure. But when attention becomes routine, the value aspect tends to disappear, and the process approximates the character of habit. We must also remember that consciousness is by no means limited to the comparatively small group of processes which can figure in attention at any one time. We are aware of vast masses of sensation from without and within, of impulses and associations, which we do not attend to, but which are nevertheless part of the field of consciousness. The processes to which we do not attend lack clearness and possibly differ in other ways such as intensity and duration. For the most part, they are indifferent, *i.e.* they possess no value, though sometimes they may be distractions or possess a negative value. This goes to show, therefore, that such characteristics as clearness and value are due to the converging and organization of tendencies. They are not accounted for by merely calling them facts of consciousness, though consciousness is a generic condition of their existence.

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[1] In connection with attention see Titchener, "A Textbook of Psychology," 1913, esp. pp. 276–284.

Consciousness is like Aristotle's form of the body,[1] in so far as it is inert as to the carrying on of bodily activity. It does not figure as a cause in the process. It does not make the engine go. Nor is it the potential energy actualized, as Aristotle supposed, since it is not statable as energy at all. It is a new fact added. It makes a difference, however, both as to the value and the control of processes. It makes possible prevision instead of mere cumulative habit, as well as illumines immediate value. Significant activity, in other words, requires two attributes or independent variables to describe it — energy and consciousness. It is a mistake to suppose that our ideals are mere coruscations or halos, byplays to the going on of energy. They are energies, tendencies, aware of their direction and with a complex structural machinery in the way of association and habit at their disposal. That the organism is relighted, even as a candle in the night, can be easily understood, if we attend to the energetic conditions on the one hand, and consciousness on the other.

The pathological phenomena fall as easily under the account of structure and awareness as the normal. Such phenomena as lapses of memory, alternating selves, multiple selves, etc., can easily be met on this theory as due to physiological disorganization, not to disorganization of consciousness. However dissociated or split the associative systems of tendencies may be, consciousness remains identical.

Since consciousness as awareness is a condition of all value, it cannot decide as between values; it cannot, as consciousness, legislate between higher and lower values or pick the permanent from the transient. They are alike conscious; and, therefore, their different claims must be decided on the ground of organization, not on the ground of awareness. It makes the realization of tendency significant, both immediately and in perspective, past and future; but it has nothing to say as to what tendencies should prevail; which are valid or invalid values. Since objects are pleasing and beautiful in relation to our tendencies, and since our whole universe of tendencies may be low or abnormal, and yet be consistent within itself, consistent art or poetry or life, but *low*, we need another dimension besides energetic tendency and consciousness to decide what values or ideals shall prevail, which is the seeming and which is the real direction, if the universe is to have ultimate significance. It may be the wrong meaning, the wrong scale of values, the wrong pleasures and pains, a low universe of appreciation. If so, they must be eliminated and new universes of value be made to prevail. We must, therefore, assume besides energy and consciousness a formal attribute. The universe must be so constituted as to have such an objective form as to condition survival of individual streams of tendency, as well as social conventions, in order that new and higher universes may prevail in the long run. Consciousness, as awareness, does not explain any particular value or meaning, nor does it determine the validity of values and meanings. It is a general precondition without which there could not be value at all.

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[1] In the Aristotelian spirit, Santayana has tried to show how consciousness, though inert, furnishes the meaning and value of process. But Santayana fails to distinguish between consciousness and psychological processes. The latter are not inert. See "Reason in Common Sense," Ch. IX.

The Distribution of Consciousness

We must say a word about the distribution of consciousness or its place in the cosmos as a whole. The distribution of consciousness, so far as psychology is concerned, is a comparatively simple matter. It is a question of evidence; and we can get introspective evidence of consciousness only when we have associative memory. This already presupposes complex organic conditions. Whether memory can be present below the grade where we find a nervous system is a matter of evidence, too, and should not be settled *a priori*.

Within the range of our own experience, we find many degrees of attention. These degrees depend upon associative organization, or the complexity of the conative system, consciousness being present and undivided in all the stages. The question arises: Can there be awareness below the level of associative memory and meaning? We can at least find transition links toward such a state. We are sometimes aware of having been dimly conscious, as in going to sleep or in just waking, without being able to recall any ideas. This dimmer awareness is here continuous with ideational awareness, and so comes to mean something as a background. The epileptic and the somnambulist respond to stimuli as though they had sensory consciousness, even when they furnish no evidence in the way of memory. The first conscious states of the infant must be such a dim awareness without meaning or "knowledge about." The dog, and still more, the pigeon and the frog, seem to react on various sense stimuli as though they had sensations, even after their hemispheres have been removed, though the evidence shows that there is no reference to past experience, and therefore, no meaning. There may also be an immediate consciousness of agreeable and disagreeable in connection with conative realization and its cumulative disposition below the level of associative memory. At any rate, the same fundamental type of organic reactions, expansive and contractive, are present. Where such awareness stops it would be impossible to say, and for purposes of continuity, we may find it convenient to assume it clear down. Such awareness, where the conditions differ radically from our own must be problematic, a mere x as far as knowledge is concerned, virtually split off from practical purposes. It is consistent, however, with the fact which we have tried to bring out above, that the meaning of the awareness, what sort of meaning, and whether it means anything at all, is due to energetic structure.

This is very different from supposing that there are feelings outside of consciousness. That is mere nonsense. Feelings imply consciousness. The question is whether consciousness as an ontological presupposition exists below even the dimmest or most confused processes of experience as we know it. There is no easy line psychologically; and logically it is simpler to assume the presupposition of consciousness than to derive it from non-conscious processes. It is easier, for epistemological purposes, to suppose that consciousness is a constant, rather than that it butts in; that it shines upon the just and the unjust, the simple and the complex, and in all kinds of weather, and that the difference in its effectiveness is due, not to it, but to the energetic conditions in the universe. For meaning structures differ from non-meaning structures not only in consciousness, but in organization. And only in the latter respect do meaning structures differ from other meaning structures.

Consciousness may be universal, as time and space are universal in the world of energetic relations, though we can only know it or have direct evidence of it where it makes a difference. We do not know it as split off, any more than we know anything else which is isolated. The question what consciousness is, if there is nothing but consciousness, is as sensible as the question what difference space makes if there is nothing but space. Attributes of reality are "not divided by a hatchet." It is not necessary to regard them as more split off in nature than we find them. Consciousness does seem to be split off in our own personal history, so far as making any difference under certain organic conditions is concerned, as in dreamless sleep. It may be the same in connection with the simpler processes of nature. At any rate, to suppose consciousness existent, even when the conditions for its effectiveness are wanting, waiting, as it were, for the conditions to appear, or to be made effective through the conditions, steers clear of the question of origin, and so greatly simplifies our metaphysical problem. Its effectiveness, we have seen, consists merely in contributing awareness. I can see only two ways of accounting for the presence of consciousness. It must either be a constant — as I have tried to show above — or it must be created outright, when we have evidence of it. Materialism amounts to the latter view. Moreover, this miracle would have to occur not only once and for all, but would have to be repeated every time and everywhere that consciousness is known to appear. Such a heaping up of miracles is hardly consistent with the modern scientific spirit.

It behooves us to remember at any rate that our blindness and dogmatism is no measure of the distribution of consciousness. To some of the Cartesians, animals below man were mere unconscious automata, and they could proceed with good conscience in their vivisectional experiments. Later, the higher vertebrates were conceded mental reactions similar to those of man. For the most part, the tendency has been to ignore types of mind different from those which we find in the higher vertebrates. Comparative psychology, however, has shown that the higher insects show intelligent behavior which, while different, is not inferior in complexity to that of the vertebrates.

The instinctive intuition of the bee shows possibilities, in the way of social organization and material manipulation, which parallel the higher achievements of abstract intelligence. The architecture of the bee from the point of view of economy and adaptedness would in the series of intellectual development presuppose the highest tools of mathematical science. As opposed to the dogmatic theory that intelligent behavior stops with the disappearance of the nervous system in the animal series, we have the recent investigations by Jennings and others which show that the behavior of microörganisms indicates cumulative learning by experience in the way of habit formations. In the case of plant life, we find a series of increasing complexity of behavior which is more and more attracting our admiration. While in our own life the functions of nutrition, respiration, and propagation are conscious only in unusual states (though they contribute importantly to the total cœnæsthesis of well-being and value), perhaps "no such eclipse occurs in plants, and their lower consciousness may therefore be all the more lively. With nothing to do but to eat and drink the light and air with their leaves, to let their cells proliferate, to feel their rootlets draw the sap, is it conceivable that they should not consciously suffer if water, light, and air are suddenly withdrawn? or that when the flowering and fertilization which are the culmination of their life take place, they should not feel their own existence more intensely and enjoy something like what we call pleasure in ourselves?"[1] So Fechner, one of the greatest of scientists, thought; and even though his account may so far have to be credited to the poetry of science, his intuition, based as it is on scientific analogy, is at least more reasonable than materialistic dogmatism. Certain it is that in plant behavior we find selection and adaptation which resemble and even rival operations which we know to be conscious in the higher animals. Perhaps with new tools and scientific patience, the future may prove Fechner's vision to be something more than analogy. With Fechner, we have to consider the possibility that, just as functions, which exist in isolation in inorganic nature, such as sound and light, are synthesized into the sensations of an individual organism, so

[1] James' account of Fechner, "A Pluralistic Universe," pp. 166 and 167.

there may be a more comprehensive synthesis where our one-sided perceptions and valuations are taken up together with those of other structures which are comparatively strange to us, into a more adequate ensemble. For Fechner's scientific mind, the earth-soul and the hierarchy of cosmic organization furnish the possibility of such higher systems. For simpler, but equally devout souls, practical and emotional needs have opened the curtain to a Presence with an infinite capacity for sympathy and companionship, for whom all our hairs are counted, and without whose tender solicitude no sparrow falls to the ground. At any rate, we must confront the possibility that consciousness and mind are not limited to our skulls, or to skulls like ours.

Some Other Problems

The chief difficulty, as regards the presence of consciousness, has come from regarding consciousness as private or individual. If we regard consciousness as one and undivided, one character, the same everywhere, as space is the same, we shall avoid this stumbling block. We do not suppose that there must be as many real spaces as there are bodies. Real space has only one effective character, binding upon all alike so far as they are individual energies. It makes the difference of distance. So consciousness does not differ from moment to moment or from one conscious being to another. So far as there is privacy or opaqueness it lies in individual organization, not in consciousness. If there is one conscious being in the universe, therefore, consciousness is as real as though there were billions, since consciousness is not a matter of quantity. And, if we find it difficult to think of consciousness as split off, we must remember it only seems split off from the individual point of view. In the whole it is really present as a constant property. In the total universe, moreover, even if we find it difficult to imagine consciousness in the abstract, we can imagine some individual as possessing the structure for significant awareness at any one time, even on the theory of chances. And, if this does not satisfy us in the changes of cosmic weather, we can have recourse to the guardian of Israel who "shall neither slumber nor sleep." The constancy of energetic conditions for such a being we can now conceive as possible. As the simplest organic being, the unicellular organism, has an indefinite life, so we may imagine the highest or perfectly organized being as having the conditions for permanent life and consciousness in himself. It is we half-men that struggle. Such a being we shall have reason, no doubt, to assume, on ethical and religious grounds. If so, it will greatly aid our imagination, even if it does not increase the coerciveness of our logic. The need for a permanent consciousness might even count as one of the arguments for such a being, if unconvinced of the possibility of such permanency in any other way. Better such an assumption than the heaping up of meaningless miracles.

And why should we assume that consciousness is subjective in the sense of private? Whether facts are subjective or not must be determined on other grounds than their being conscious. My being conscious of facts does not *prove* them subjective. My fellow man, music, color, etc., do not become subjective because I am conscious of them. In that case all facts would become subjective. The test of subjectivity or objectivity is whether they can be shared by several observers. Those are subjective processes which can be facts for one observer only. Those are objective which can be shared by several observers. Thus pain is subjective, in so far as I can not put another observer in a position to have the same process; while color processes must be objective, because another observer can share them as much as he can share any object. I may for certain purposes, mechanical purposes for example, ignore the color properties and select the geometrical properties, but that is another story, and has nothing to do with objective reality. The survival value of treating such properties as color and sound as objective would of itself be a strong argument for their objective existence.

The matter of subjectivity after all is largely a matter of degree. The closer we come to similarity of conditions, both of situation and individual structure, the nearer we come to a sharing not only of logical meanings, but of feelings and emotions. We come to have common sympathies. It is customary to speak of images as private, as contrasted with perceptions, and yet, as Le Bon and others have pointed out, images, especially visual images, furnish the most effective social means of persuasion and common action. They furnish the bond of the mob. If imagery were as private as the psychologists try to tell us, poetry would be well-nigh impossible.

Psychology as an introspective science, moreover, has no monopoly of consciousness. In fact, it does not have occasion to deal with consciousness in the abstract. What it studies is the laws and tendencies of conative processes, processes in part, or part of the time, conscious, *i.e.* issuing into consciousness under certain conditions or presupposed as mental constitution by the conscious moment.

This theory furnishes a decided advantage from the point of view of accounting for perception and knowledge. By doing away with the superstition of the privacy of consciousness and showing its identical character everywhere, it reinstates the world of energetic continuities which has proved so fruitful a conception in science. This theory recognizes privacy, but it is a relative and explicable privacy. It is due, not to consciousness, but to individual variation of structure, to unique ensembles of tendencies, which consciousness serves merely to reveal. If such uniqueness is a drawback to communication, it is the raw material of progress. Moreover, it bears close relations to the race life all the while. It is a deviation merely from the common race stock, the continuity with which must make its originality significant. It is not a charmed circle. This conception of consciousness does not indeed solve the problem of knowledge. But, inasmuch as for this theory consciousness becomes merely a universal postulate, so far as the knowing function is concerned, therefore consciousness no longer complicates the problem, which now becomes one of energetic processes and their relations. This problem is a twofold one. It must explain on the one hand how one energy can know another, whether differing in complexity or in kind, and on the other hand how our energetic purposes can know realities which are not energy, including consciousness itself. This problem has been dealt with elsewhere.[1]

This conception of consciousness greatly simplifies the problem of energy. It destroys the old conceptual cleavage between mind and body, or physical energy on the one hand and psychological processes on the other, by making consciousness a fact independent of energy. Nature knows no cleavage of energetic interactions. Why should we, by our concepts, put asunder what nature has joined together? The scientific theorist may now go ahead and simplify as he pleases, irrespective of consciousness. All we ask is that his conceptual model shall meet the energetic facts.

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[1] See "Truth and Reality," Macmillan, 1911, Chapter XIV, "Pragmatic Realism."

Is consciousness diaphanous? If this means that consciousness makes no difference at all, that processes are the same when they are conscious as when they are not conscious, that we are the same asleep as awake, then the question is absurd. But if the statement that consciousness is diaphanous merely means to emphasize that consciousness does not make or alter the energies of things; that no properties of things are constituted by consciousness; that the only difference it makes is awareness, which is not a causal relation, — if this is what is meant, it agrees with this theory. On the other hand, while consciousness does not make properties or structures, it is a general precondition of our interest in them and their value for us.

The question has been raised by a certain school of idealists as to whether the universe would vanish if there were no consciousness. Why should it? I do not vanish as a set of energies when I am asleep, not even when no one takes account of me. I have no *evidence* of consciousness — and evidence would mean memory, and so awareness of the meaning type — during seven hours of last night, and no one perceived me, and yet I can go on with my plans of yesterday. Moreover, there was change and development in the meantime, of which the waking moment must take account. The world looks different from what it did at the time of my going to sleep. Problems have taken on a new meaning. So nature, too, could have rhythmic pulses. Yet in its waking moments, it would know it was real in its sleep, and could furnish evidence in the way of changes which must be interpolated between its waking moments, and which do not happen when they are taken account of, but must be taken account of because they have happened. Of course, if the whole world were asleep, the sleep of Endymion would have no significance, though real nevertheless if conditioning his waking up.

Every theory of reality must meet certain practical problems. And the question probably has suggested itself before now: What becomes of immortality on this theory? To this I will answer that the problem of immortality is the same on this as on any other theory. It can be neither proved nor disproved by theories. To say that everything is experience, irrespective of evidence, does not help the problem of immortality one whit. The facts of transmutation and the demand for individual continuity would still remain. As individual immortality means, not the simplicity of the soul nor the immortality of mere consciousness, but the carrying over, perhaps, of memories, or at least of tendencies, the problem becomes an energetic one. Individual immortality would depend upon the continuity of energetic conditions, not upon consciousness. It would be difficult to show that we constantly possess awareness during the sleeping and waking of this life even. Moreover, energetic continuity need not mean the gross continuity of the body. Race continuity involves only one specific form of energy, and a small portion at that. So it may be with individual continuity. If we can carry tendency over, tendency to think and feel and act, to enjoy beauty and feel sympathy with our world, we ought to be satisfied. This is the net result of it all. This view, moreover, would fit in with the church doctrine of the resurrection of the body, so far as energetic continuity is concerned. It would not include the clothes or shoes or Gabriel's trumpet. But these, after all, are not an essential part of the conception. The life of a disembodied consciousness would be a pretty ghost-like affair. The world of energy must furnish the principle of individuation.

Since all that is necessary to bring back personality is the presence of certain energetic conditions, with the light of consciousness thrown on them, the problem of immortality becomes at least simplified. The fact that we have not been able to trace such energetic continuity of personality as yet, is no argument. We were slow in tracing biological continuity experimentally. We have only within comparatively recent times found out something of the character of electricity and radium and the Brownian movement. The energy underlying personal continuity may be much subtler than these, and the favorable occasion for taking account of it, in its new state, may be much more difficult to find. Perhaps the spontaneous trance, as in the case of Mrs. Piper, may furnish such an opportunity. This remains to be established. At any rate, we have no right to assume that a certain gross energetic condition to which we are accustomed, is the only condition under which consciousness can appear. We have discovered a multiplicity of conditions under which electricity can appear. To be sure, these are only analogies, but I have shown at least that this view is not hostile to the conception of permanent personality. What really is the place of man and God in the universe must be established by the evidence of human experience and not by *a priori* reasoning. And they must have a place in the universe if human experience in its progressive evolution continues to require them. The realities of the ego, of God and immortality, remain what they are, on any theory. If the evidence proves that they must be, then they can be.

Conclusion. — This view of consciousness is self-consistent; it is economic in that it assumes consciousness as a constant and thus avoids the problem of origin; it is also economic in avoiding the duplication of structure involved in separating physiological and conscious processes. It meets all the requirements of biological evolution, and of normal and abnormal psychology. It accounts for the intermittent character of awareness. It meets the practical demands as well as any other theory. It does not prove them, for this must be done by evidence, but it makes them possible.

CHAPTER IX

Knowing Minds

I

In trying to know the self, we must recognize in the first place that our concern must be with the finite self and its processes. We cannot even conjecture a mind different from ours. Such a mind must turn out in the last analysis to be an abstraction from our own experience. The idealistic absolute is merely our own ideal of a completed knowledge, not a different mind.

In the second place, the method pursued must be naturalistic. We must strive to know a self as we try to define a chemical element — through its conduct, not through *a priori* considerations. We would not say that the self is its behavior, any more than we would say that a chemical element is its behavior. It is not only the way it now behaves, but the way it *can* behave in all possible situations. The self is what it must be taken as in its behavior, by itself and by others, in various contexts, physical and social, especially the latter. It is not something over and above the properties as known in situations; the essence appears completely, given the proper conditions. There is no substance except energy. The self can be as truly known as a chemical element in the tests of various situations. It has its breaking point in the stresses and strains of experience as surely as cast iron; its melting point as surely as gold; its freezing point as surely as water; its explosion point as surely as dynamite; its point of confluence with other selves as surely as wine mixes with water; it separates from other selves as surely as oil refuses to mix with alcohol. Habits, motives, characters are but expectancies of varying complexity, which we can have as regards the self with reference to definite situations. Of these situations, the social situations are by far the most important — the only ones in fact which would make self-consciousness in the first instance possible. But, secondarily at least, physical situations, too, count. In them we learn our strength and courage and many other properties. The self in any case is what we must take it as being in conduct. It has spontaneity, if we must acknowledge spontaneity. It is a mechanism, just in so far as we can treat it that way. We must learn to take the mind *as known*, and not as the epiphenomenon of material processes on the one hand or of a transcendent substance on the other. We must start with facts, not with dogmas. Its properties indeed are different from those of material things. It has no gravitational mass. But neither has electricity. Its properties differ in different situations. But so do those of any physical thing. The visual properties of the diamond don't cut glass. While difficult sometimes to calculate, owing to lack of organization or owing to complexity of motives, still its conduct is largely predictable. Human institutions of credit and confidence are built on such predictability. Taken in the average such predictability becomes well-nigh absolute. Where the self differs radically from a physical thing is in the fact that consciousness is superadded to its activities and so gives them meaning and value for the self. But while this adds subjective significance, it does not prevent us from taking account of the properties of the self, past and present. And the property to have mercy is just as much of a property as the solidity of steel.

Like radium, mind is not as yet known to exist in an isolated state. We know mind, for certain at least, only in connection with physiological processes, though we may hope for more corroborative evidence of the existence of mind after death. But while mind exists in connection with physiological processes, we know it nevertheless as pure; and we know it better than we know anything else. When we take account of our own meaning or try to understand another living mind or try to get the significance of a poem, in either case, nerves don't get mixed up with ideas, any more than the letters on the page get confused with the meaning we try to decipher. We know mind as it is. Whether we know its existence apart from certain physiological conditions or not, itself we know as clear and distinct a fact of its own kind, with its definite internal as well as external relations.

II

This is as true in knowing other minds as in knowing our own. The knowledge of other selves has been confused by two theories. One is the theory of analogy, viz. that we know other selves only by analogical inference, based upon the similarity of other bodies, and their behavior, with our own, while it is only our own mind that we know immediately. This theory confuses the problem of causality with the problem of knowledge. It is true that our minds must make differences to our own bodies and their physical environment before their behavior can be overt to others and *vice versa*. But it is not true ordinarily that in knowing we argue back from bodily structure to mind. Man had composed great epics, laws, and religions, built all the fundamental social institutions, before he knew there was such a thing as a nervous system. And even now the knowledge of the relation of mind and body is decidedly problematic and not to be compared with our knowledge of the mind's own relations, as we know it in logic, psychology, and ethics. To be sure we sometimes start from structure in dealing with lower animal minds, but this is just the beginning of hypothesis, not real inference as to the mind's own nature. This must be understood through conduct — its intelligence and docility, quite independent of the presence of a nervous system. It certainly seems absurd to suppose that men should first study the connection of mental states and bodily expression in themselves and then read a mind back of the expression and structure of others, — and this before they know anything about the connection of mind and body in themselves or have even distinguished mind from body. It seems pretty clear that they start the other way; that they first learn to recognize purposive conduct in others, before they become aware of the relation of mind and conduct in themselves. They learn to associate emotions and attitudes with expression in others before they are conscious of expression in themselves.

The other theory is the mystical theory. It argues for the immediacy of the knowledge of other minds without reference to interaction or behavior. We immediately acknowledge other selves and that is all. Such acknowledgement is based upon no inference, implicit or explicit. It permits of no genetic analysis. Now this theory is certainly nearer true than the previous, from which it is a reaction. The knowledge of other selves may be regarded as immediate as that of our own. We know ourselves, as we know others, through the situations upon which we react. But this is quite different from holding that we have a mystic knowledge of ourselves in the abstract or of others in the abstract. In the abstract our significance equals zero. The knowledge of other selves is neither a matter of analogical inference nor of mystical appreciation but the homely way of reading conduct. And as social adjustment is a centrifugal process, it is natural that we should have formulated our own significance in terms of social situations — of social approval and disapproval, before we began to formulate the relation of social situations to our own ideals. The learning process is at first a purely objective process. A boy friend of three was confronted with a small misdemeanor. He recognized by the situation that it was a wrongness. He steadily maintained that he had not done it. His father sternly and sadly said, "Bobby, are you telling me a lie?" He was finally brought round to the right point of view with his mother's assistance and owned his act, with the solemn impression that the serious thing about it was telling a lie. The next day he astonished his parents by adding to an answer which he made "and it is not a lie." Through one tragic social context he had learned the significance not only of a word but of a social relation. It is safe to say that he did not compare the parent's bodily expression with his own.

In the progress of experience, language as an artificial expression of mind, with its complex network of relations, largely takes the place of concrete situations for knowing minds. And our knowing our own mind, past and present, as well as knowing other minds, becomes the immediate recognition of the meaning of the language situations, until in the technical disciplines concrete imagery very largely drops out in our reading of meanings. The matrix of language, with its artificial equivalents for things and relations, becomes the social correlate of our communication and understanding of minds, not brain cells and association fibers. And logic, geometry, and ethics as sciences of social mind relations reached a high perfection as sciences before neural physiology was born. In social communication, what we are immediately concerned with is words, conduct — not brain states. In talking with an individual, as in reading a book, we are concerned not with causes and effects — the producing of the spoken or written symbols and their reaching our, or the other party's, sensorium. We are concerned with the interpretation of the symbols. The words are immediately associated with certain meanings; and our attention is fixed on the meanings, not on the instruments. As the ivy clings to the material framework which supports it, so do our meanings in every joint cling to language, only the meanings make their own framework as the nautilus builds its chambers.

While it is true that in understanding other selves we are dealing with the social matrix of language and meanings, still this does not prove that brain processes, nerves, vocal chords, air waves and ears or eyes do not mediate causally between selves in communicating with each other. The teleological explanation and articulate acknowledgment of meaning by meaning would not be possible, in our sense world at least, if the communicating minds were not part of the causal nexus of the intervening world.

III

A great deal of mystery has been thrown about the dual nature of the self by traditional psychological theory. It is supposed that there is an absolute and invariable relation between the *knower* and the *known* or, to use James's phraseology, the *I* and the *me*. This is true not only of the old rationalistic psychology with its metaphysical soul, but it is true of recent treatments. Says Wundt: "Every experience contains two inseparable factors — objects of experience and the experiencing subject."[1] And Ebbinghaus: "Wherever thoughts and sensations are experienced, this subjective bearer to which they adhere, also becomes directly conscious in them and through them, in the same way as they themselves."[1] And even James: "It is obvious that if things are to be thought in relation, they must be thought together or in one something, be that something ego, psychosis, state of consciousness, or whatever you please."[2] This something to be sure is a "a spiritual something." Still its externality to the empirical situation is implied. When I try to make clear to myself what this simple bearer is which is constant in all the states and logically distinct from them, it seems to be nothing else than the abstract fact of consciousness itself. This certainly is constant and simple and accompanies all our conscious states. It is also separable from them, as mental processes need not be always conscious.

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[1] Wundt, "Definition der Psychologie," *Philosophische Studien*, 1895.

If what is meant is that all experience involves the subject-object relation or is representative, certainly some doubt may be thrown from the side of the facts. When we *think* we of course always presuppose the subject-object relation, but is this true also of the simpler perceptual stage of experience? Could a creature, depending upon impressions and upon learning by habit without any images, say *I*? This does not seem likely, because there is no conscious context, which assimilates. In all experience, too, there must be a beginning, a bare "awareness of" without any "knowledge about," *i.e.* without any associative context to react, where our experience *is* the light or the pain rather than *has* it. I do not see how such experience could have the consciousness of "two inseparable factors, objects of experience and experiencing subject." In my own experience in waking up gradually after having been struck by lightning and snowed under in a storm on Grays Peak, I could remember afterwards when I was a mass of pain and discomfort with no associations suggested in the way of danger or death. I could remember having seen the form of a man moving down the mountain side. But it was not until some time afterward that the perceptual picture suggested man and a futile cry for help and not till long afterwards that the perception suggested my companion and that the scene itself came back to me. There was certainly a period there of pure perception, while the associative context was as paralyzed as my bodily movements. It would seem that there is a simpler state of consciousness than the *I* and *me* relation — the state of bare awareness, which, of course, is not broken up except by a more complex consciousness, which reflects upon it. Leaving aside, however, the question of the universality of the subject-object consciousness, what does it mean when we do have it? And is it such a mystery?

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[1] Ebbinghaus, "Grundzüge," Vol. I, p. 10.

[2] "Principles of Psychology," Vol. II, p. 277.

The mystery of the subject-object relation seems to disappear when we bring a little psychological analysis to bear. Abstracting from consciousness as bare awareness, we must make clear to ourselves what we mean by the subject-object relation in the concrete; and then we shall see that it is a selective context responding to a specific content — the datum. The quality of *myness* is a function of the datum-being-selected by this individual interest. In other words, to say this is *my* object of consciousness and to say I am interested in this object are two different ways of saying the same thing. The I or subject in this relation is the active associative context, which we call interest, solicited by or striving to find its object, the me. In order to get rid of ages of false association we may call this context the *referent*, and the datum which is selected the *relatum*. Now my contention is that there is no absolute or constant relation between the selective context, the *referent*, and the selected object, the *relatum*. On the contrary, the distinction is relative to point of view and relative to time. In the first place, it is relative to point of view. This may be true within the same physical individual, as in the case of the divided self. In deliberation, the point of view shifts while the systems seem exclusive and constant. Now one system is tried out with reference to its antagonistic systems. And again the activity shifts to another system with its scale of values. But the struggle is precisely between coexisting and conflicting points of view. There is of course some common and constant group of tendencies which figures in the various systems and which accounts for the shifting of attention. It is this common group of more or less explicit tendencies which gives rise to the feeling of outside push as regards the process of deliberation. The systems in intense moral struggle may coexist antagonistically for some time — each with a strong individual consciousness, and each struggling for the place of mastery, now one, now the other occupying the focal place — the lower taking the higher captive, the higher in turn summoning its energies against the lower, each very much alive and struggling for existence. In insanity we have cases of actual disruption of the various systems, when a man feels himself to be not one but many — thoroughly bewildered in the shifting and many-headed focus, as to which is I rather than the other. In every case of social communication where one system of meanings strives to understand another, the relation of *referent* and *relatum* is reciprocal and a matter of point of view.

Not only is the relation of I and me relative as between *coexisting* systems, internal or social, with their respective points of view. But the *same* associates may be part, now of the *referent* and now of the *relatum*, in the one personal history. In recalling a forgotten name, we use the meaning to find the name. The system of associations with its leading is the *referent*, the name the *relatum*. But having gotten the name, we reverse the process and use the name with its larger context to fix the meaning. It is my purpose to open a refractory door. This system of tendencies, the *referent*, hunts about for means, the *relatum*. But in trying to solve the door situation, the purpose becomes aware of its own vagueness and limitations. It thus reverses itself in a measure; the door-consciousness with its associations defines the purpose to open and both are taken up into the larger context which was implicit in the procedure — getting what I wanted in the room, etc. The relation of I and me then is not a constant or absolute relation. There is no more mystery about the I than about the me. What figures one moment as part of the tension of the apperceiving factor may figure the next moment as part of the tension of the apperceived. They are both functions of a more or less definite system of tendencies which strives to realize itself and which we may call the self in the inclusive sense.

If this theory is true, it should follow as a corollary, that self-consciousness, *i.e.* consciousness of the I and me type, should be prominent in proportion to the activity of attention, being particularly obtrusive in the moments of embarrassment and frustration, while approaching the vanishing point with the fluency of the ongoing of consciousness, when the felt unity radiates in all directions of the prevailing purpose. This seems actually carried out by the facts of experience. It is when the developing purpose is brought to halt, is balked for the time being, that the consciousness of meaning and datum, *referent* and *relatum*, becomes painfully strong. On the other hand, when the flow is uninterrupted, when the purpose is absorbed in the transitions from phase to phase, whether the fascination be intellectual, practical or æsthetic, the dualism of I and me approaches its vanishing point until lost in the mystic trance — the passive, coalescent state of attention.

Hume in speaking of the self as a "bundle of perceptions" fails to take account of the active character of the referent factor in the subject-object relation. The self, whenever we are really awake, is an *active* bundle of more or less systematized tendencies striving to appropriate or adapt itself to an external context, the datum. It is the latter context that has the stubborn perceptual character. The self is not a bundle of perceptions. It is a bundle of tendencies, leadings, purposive striving. This is the substantial core of the ego, but it is a shifting, moving core, an organization which comes to consciousness through conflict, not a blank entity which is merely externally related to certain objects. The perceptions, whether internal or external, are the facts taken account of — the me. You can't have an outside without an inside; and Hume[1] made the self all outside. You must add to the content factor an active apperceiving factor.

While it is true, moreover, that the process of knowing always implies one context added to another, in an empirical situation, we must not neglect the unique relation of the factors involved. The addition is not a mere external addition, but one of creative synthesis, analogous to chemical addition rather than to mathematical. This creative addition *is* the unique relation of interest. There is nothing to show that it alters the character of the factors — the object known or the context knowing — in other ways. While there is some doubt as to whether the selective reaction, which we call attention, intensifies the data emphasized, the qualities and relations of the data remain the same. We do not create them by taking account of them. The cat does not create the king by looking at him. Nor does he add a cubit to his stature. What is added by the interest relation is subjective clearness and significance.

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[1] "Treatise on Human Nature," Vol. I, Pt. IV, § 6.

The difference between the two factors in the interest relation cannot be resolved into the greater or less permanency of the associates involved in each case. This seems to be the theory of William James: "The two collections, first of its cohesive, and, second, of its loose associates, inevitably come to be contrasted. We call the first collection the system of external realities, in the midst of which the room, as 'real,' exists; the other we call the stream of our internal thinking, in which, as a 'mental image,' it for a moment floats. The room thus gets counted twice over."[1] As a matter of fact, the apperception context need not be less cohesive than the context taken account of. It may be, and often is, the more permanent of the two. The meaning or attitude may remain constant though the object changes. Our loyalty may remain through the objective vicissitudes of a lifetime. Without this constancy in our tendencies, the concept of constancy would be impossible. As to the object being counted twice, this is only an afterthought when we contrast memory with perception. In our perceptual judgments, the object is counted only once, *i.e.* as being in its own context, though it may, of course, be counted wrongly as between objective contexts. This is what happens in illusion.

The unique character of the *referent* context consists in the fact that one factor or ingredient in the context is conative tendency. It is true that the subject-object relation is in part reversible. But this is as regards its contents or associates, not as regards the unique attitude itself. It is the objects which may figure twice over, — or rather be identical in a large number of contexts, — as part of a context of interest, and also as having certain relations, temporal, spatial, causal, etc., to other contexts. The uniquely subjective relation is a conscious reaction between a system of conative tendencies, on the one hand, and a set of stimuli, intra-organic or extra-organic, on the other. The relation of interest or experience cannot exist unless there is the unique reaction of these two factors. The apperceptive factor in this relation is a system of associates, given direction and held together by conative tendency.

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[1] "Essays in Radical Empiricism," p. 22.

To say that the relation of subject to object is experience added to experience, looks like the old fallacy of division. Experience is here predicated respectively of the experienced stimulus, whatever it may be, and the apperceiving system, each taken in its abstract capacity, and apart from the unique context. Neither can be called experience until they constitute the unique situation of interest. To say, therefore, that this situation is experience added to experience, seems to be a case of putting the cart before the horse. James, in this case, seems to have fallen into the very intellectualism which he had combated all his life. What makes us distinguish the subjective from the objective factor is the function of selection and emphasis. This function cannot in turn be expressed in terms of the selected object without a hopeless circle.

There has been a strenuous metaphysical attempt of late to get rid of end terms altogether in the interest relation. We are told that the pure stuff or content of reality is entirely neutral, and that the seeming difference in kind is due merely to the external relations in different contexts. Says James: "There is no general stuff of which experience at large is made. There are as many stuffs as there are 'natures' in the things experienced. If you ask what any bit of pure experience is made of, the answer is always the same: 'It is made of *that*, of just what appears, of space, of intensity, of flatness, brownness, heaviness, or what not.'"[1] Again: "Thoughts in the concrete are made of the same stuff as things are."[2] The same idea has been championed by E. B. Holt: "The entities of the universe have no substance, but if the spirit is weak to understand, then let flesh, for a season, here predicate a neutral substance. These entities are related by external relations. A consciousness is the group of (neutral) entities to which a nervous system, both at one moment and in the course of its life history, responds with a specific response."[1] With Holt, however, this neutrality seems to resolve itself, in the last analysis, into a materialistic atomism. With James, on the other hand, it is part of the philosophy of pure experience from which subject and object are regarded as abstracted by subsequent reflection.

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[1] "Essays in Radical Empiricism," pp. 26, 27.

[2] *Ibid.* p. 37.

There seems to be an ambiguity here as between the experience relation, and what is experienced. What is *experienced* may be any kind of thing, physical or mental, that can make a difference to our conative purposes. Our thoughts in the concrete may very well have things as their contents; and then there is no difference, of course, between the content of thoughts and things. They may, however, have mental processes as their contents. In any case, such an ambiguous metaphysical use of the term experience at best obliterates what have proven pragmatically useful distinctions. It does not help us to understand the unique character of the relation where one context evaluates and takes account of another context. Duality there *is*, somehow, in the relation. The context which knows, or is interested, is an integral volitional context, and not merely an ensemble of externally related contents. What the ultimate stuff of reality is, that is another question, and must be determined by the requirements which we must meet in the realization of our purposes.

The prejudice against end terms in the knowledge relation, and the consequent attempt to eliminate terms altogether has a double reason. One is a metaphysical reason. It is a protest against the occult conception of mind as a substance, outside of and irrelevant to the stream of conscious processes. With this protest, we must agree so far, that the mind must figure in the empirical situations, and must be known as regards its properties and constancies precisely in such situations. The other reason is epistemological, and is a protest against subjective idealism, which makes the existence of the object depend upon being taken account of, or figuring for the time being as part of our conative interest. With this protest, too, we must essentially agree. Our being interested in an object does not create it, — does not constitute either its existence or its objective qualities. That the tree is part of a physical space context is not due to our noticing it. Even that it is green is not due to our taking account of it, but to the energetic relation between certain light waves and our physiological organization. Nor do our mental structures come into existence with our taking account of them. They have a context of their own which we must recognize. Our interest brings a *new qualification* to the energies which are taken account of. But their properties and relations outside of this must be regarded as external to the cognitive relation, *i.e.* as having an existence of their own whether mental or physical. Only so is science possible.

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[1] "The New Realism," pp. 372, 373.

What we insist is that the relation of interest is a real and unique relation *when it exists.* And it involves a conative constitution as one of its reagents. There is nothing mysterious or occult about this, any more than there is about the relation H_2O. Each is a unique energetic result. Each must be recognized in its own right. The relation of mind to stimulus in the case of interest is no more neutral than any other energetic action is neutral. But what do we mean by mind?

CHAPTER X

Knowing Minds (*Continued*)

IV

In taking up the question: *What is mental?* we must be warned at the outset that the phrase, "in the mind," is an ambiguous phrase. In a sense, anything to which we attend is in the mind for the time being, *i.e.* it figures as part of our field of interest, but it is not therefore mental. G. F. Stout suggests as a criterion of a fact being mental that it is so dependent upon mind, that if mind should cease to exist, it would cease to exist also. This may be granted, but it assumes that we already know what is meant by mind. Stout and Alexander agree in defining mind as "the subject of activity in the way of conation and attention, and also of feeling in the way of pleasure and pain."[1] We may agree that will or conative tendency, which we *know* in connection with attention and interest, is mental. Let us see how far we can apply Stout's criterion, and to what results it will lead.

G. E. Moore feels certain that consciousness, in the sense of awareness, is a mental fact. It is the only thing that is common and peculiar to all experiences — the only thing which gives us the reason for calling a fact mental.[2] Thus "the sensation of blue includes in its analysis beside blue, both a unique element awareness, and a unique relation of this element to blue."[3] The nature of this awareness is such "that its object, when we are aware of it, is precisely what it would be if we were not aware."[4]

Now that consciousness is such a neutral light, I have tried to show elsewhere. But I cannot agree with Mr. Moore that consciousness is mental. "'Mental,' in one of its senses and its most fundamental sense," says Mr. Moore, "is, I think, merely another way of saying that the entity said to be mental is an act of consciousness. So that, in this sense of the word, that which distinguishes mental entities from those which are not mental would be simply the fact that the former are acts of consciousness, whereas the latter are not mental. A red color is certainly not an act of consciousness in the sense in which my seeing of it is."[1] This seems an arbitrary definition of mental. It is not obvious that mental processes, such as conative tendencies, must be conscious in order to exist. Consciousness is added to them in certain energetic relations, but it does not make them exist any more than it makes the physical processes exist. Our will attitudes continue to exist and to change when we are not conscious of them, as when we are asleep. Even in conscious activity, not all of mind can be said to be conscious. Therefore consciousness is not an essential characteristic of mental.

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[1] *Arist. Proc.*, 1908–1909, "Are Presentations Mental or Physical?" p. 227.

[2] "The Refutation of Idealism," *Mind*, 1903, pp. 452, 453. See also *Arist. Proc.*, 1909–1910, pp. 38–40.

[3] *Ibid.*, 1903, p. 450.

[4] *Ibid.*, p. 453.

Neither can we regard "mental acts," in Mr. Moore's sense, as purely mental. Such processes as perceiving involve, as we shall see later, physical elements. I would say that in our awareness of blue, there are involved three factors: There is the energetic physical situation, including the action of light upon our organism. There is further the selective reaction to this physical situation. And there is, added to this, the fact of consciousness. This is a non-mental fact, and makes possible the awareness of the energetic relation. It is no more mental than pure space; and, like pure space, it is neutral as regards the contents within it, *i.e.* it permits of free mobility so far as it is concerned. If we represent the action of the physical situation upon the conative constitution under the form of three dimensions, we would have to add a fourth dimension to represent the fact of awareness. The fact, furthermore, that we know consciousness only in connection with certain conative activities, does not prove that consciousness can only exist under such conditions, *i.e.* that it would be destroyed if mind is destroyed; nor does it prove that mind can exist only when it is conscious of itself. That we can only know a fact in conscious situations is mere tautology.

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[1] *Arist. Proc.*, 1909–1910, pp. 39 and 40.

If we now take up the contents of mind,[1] it would seem that the sense data cannot be regarded as mental. Blue is the result of a certain action of a physical energy, light, upon our eye-camera, and upon the nervous system. We do not in any wise originate the quality blue or alter it by attending to it, though it comes to have significance when we do so. A sense quality is a purely physical fact. It is true that the so-called relativity of sense qualities has been urged against their objective reality from Protagoras to Stout. They vary with the specific structures of the sense organs, with the position and distance of the observer, and with pathological conditions in the observer.[2] But the relativity of sense qualities does not differ from the relativity of any other energetic relations in nature. Other energies, too, require special conditions for their manifestation; they vary with their space relations; they fail to answer expectancies under defective conditions. To be sure, in the case of some of our sensations, the quality is very much confused by its fusion with other qualities and, especially in the case of organic sensations, by its fusion with the affective tone of agreeable or disagreeable. In such cases, we must, of course, admit the psychological difficulty of analysis, but that does not make the sense quality, so far as it exists, less dependent upon the physical situation. We no more make the quality of pain by attending to it than we make the quality blue. It is obvious that destroying attention would not destroy the sense qualities, though they would no longer be sensations, in the sense of facts of interest. Stumpf and others have done excellent service in pointing out unnoticed sense data. A sound, not attended to at the time, strictly speaking becomes a sensation only when we attend to it, and that may be after the stimulus itself has ceased.

But if sense qualities are physical, what about sensory elements as we know them through revival in perception, and as they exist in images? These, too, we must regard as physical even though the immediate continuity with the outer energies has ceased to exist. They are the persisting excitements of such stimuli, having the same quality as the original situation though, in the nature of the case, having less intensity. They are as physical as the persistent effects recorded by the film of the camera.

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[1] In the discussion of mental contents, I am much indebted to S. Alexander's paper, "On Sensations and Images," *Arist. Proc.*, 1909–1910, pp. 1–35.

[2] See Stout, *Arist. Proc.*, 1908–1909, pp. 237 f.

I would not say that all the contents of our mental operations are physical. For the will may attend to its own operations. It may take stock of its own tendencies and purposes within its own complexity. These, no more than the sense data, originate or alter in character with our awareness. The observed facts here must change location from the subject context to the object context, *i.e.* they must be abstracted from their concrete setting. But they do as a matter of fact persist in such a shifting. We can take account of their character and can analyze them. Nor is such awareness an awareness of a past moment. That is absurd by definition. What is past is their functional position in the subject context. They now figure with other contents in the more abstract and artificial object construct. What we feel so keenly in our mental analysis is that much is left out of which we are aware as of prime importance in the flow and concreteness of real life. But this, of course, is true of physical reality, too, even though here we have not the same immediacy of acquaintance with the inner movement.

Even in what we are accustomed to regard as mental data, much remains that is physical. In the gross affective fusions which we call emotions, the bulk of the process, as has been clearly shown by recent psychology, is sensational in character. Whether we wholly adopt the James-Lange theory or not, we must agree that the inchoate and confused mass of organic sensations, resulting from the instinctive reaction, gives the character and warmth to the special emotions. Compared with this, the affective tone proper, which certainly does enter in as a factor, is thin and abstract.

When we come to the feelings, here it would seem at any rate that we are on solid psychic ground. But here, alas! there is a hopeless ambiguity of scientific terminology. This is due in part to the difficulty of analyzing out the affective quality proper from its fusion with sensations which are always present with it. Some of these sensations are clearly distinguishable from it, such as motor sensations and sensations of breathing. Others are subtle and diffuse, notably those which depend upon our alimentary and genital systems. These sensations ordinarily remain below the threshold of attention, but while their quality is well nigh impossible to discriminate, their effect is vital and constant. They fuse in an immediate and largely unanalyzable way with the affections and constitute the bulk of what we recognize in the concrete as the tone and well-being of the organism. Together with the sensations already mentioned, they form the overtones of our affective life. Indeed, some maintain that they constitute it altogether. In so far as we give the name feeling to the fusion as a whole, it will be seen that the bulk of our feelings, as well as our emotions, is physical in character, — the difference being merely that the feelings depend upon more general organic reactions, and thus lack the specific character of the instinctive emotions and the volume of their deeper organic reverberations.

Not only has there been confusion as regards the fusion of the affective tone with certain organic sensations, but there has been a similar difficulty as regards its fusion with certain objective qualities. Thus we are in the habit of speaking of æsthetic feelings. Beauty has been defined as constant objects of pleasure, as contrasted with the more fleeting and uncertain character of the mere agreeable. But what is constant in the appreciation of beauty are the form qualities or the content-relations, not the feeling. The beautiful object may be agreeable, and is so whenever the will sets itself the particular purpose of enjoying beauty. But it is not so always. The best music in the world becomes disagreeable when the attention has set itself the task of doing something else with which the musical stimulus interferes, as performing delicate discriminations in the laboratory for example. The form quality of the beautiful object, on the other hand, is not altered by our will, though in the case of artificial beauty the object owes its form quality to the selection and synthesis of the will in the first place. The mere fact that the feeling of enjoyment can be repeated again and again does not constitute the beauty of the object. If so, all the satisfactions of the constant tendencies of our nature would be beautiful. The satisfaction of hunger or of curiosity is capable of constant repetition, and is more universal than the feeling for beauty, but it is not beautiful. It may even jar on our sense for beauty. Byron hated to see a woman eat. The constancy of the satisfaction, in any case, lies in part in the permanency of the objective quality, in part in the permanency of a certain organization of the will. It does not lie in the feeling.

What is psychological, therefore, in our emotions and feelings is the abstract affective tone of agreeable or disagreeable, and this seems to have only those two qualities. This is dependent upon the will — its success or failure in realizing certain tendencies in terms of its stimuli. The constancy or variation of tone is a function of the dominant tendency or set of the will. Since the will like other energies is predictable in definite situations, the affective tone is in so far predictable.

The difficulty in knowing the affective qualities is not a difficulty of acquaintance. There is no mistake about the consciousness of the pleasant and unpleasant. Just here and only here the Berkeleian criterion is true that *esse est percipi*. The difficulty is entirely one of analysis. And this difficulty is twofold. It is in part a difficulty of fusion. While we can with comparative ease dissociate the affective qualities from the extra-organic sensations, it is exceedingly difficult to dissociate them from some of the organic sensations. Hence the difference in classifications. Another difficulty is due to the fact that since affection is the sense of realization on the part of the will, there is danger of changing the direction of the will by its superadded interest of analysis. This difficulty is probably exaggerated, as many processes, particularly those of the primitive instincts, have quite sufficient momentum and individuality to persist even when the interest is thus divided. Their tone depends, not upon their being part of the subject tension, but upon their realization. In more delicate cases, memory can be used to eke out immediate perception.

In so far as we look at thought in its content aspect — what thought deals with — this again is largely physical. Of course, we do form concepts of mental processes, but they are meager compared with our concepts of the objective world. Since our laws of thought are modes of operating with objects, these laws must be regarded as relations within the contents of experience. And since the contents we deal with in the operations of thought are overwhelmingly physical, we can agree with Russell that the laws of thought are the laws of things.[1] They are for science the most universal laws of things, but while abstract and highly useful ways of handling facts, they cannot be assumed to be *a priori* laws of the universe. As universal they are, like all *universals*, hypothetical. Their applicability must continually be tested through our success in explaining things, including mental things.

If we turn now from our survey of contents in the mind to a survey of mental acts or operations, our way should be clearer. But even as regards attention, which seems so obviously a manifestation of will, analysis discloses the presence of physical factors. Some psychologists have tried to state attention in purely intellectual terms. They have regarded it as merely an associative context of ideas. While this theory neglects the importance of the guiding and controlling set, which uses the associative mechanism as an instrument for its particular end, the indispensable presence of the intellectual factor in the higher stages of attention is indisputable. To get pure attention we should have to go back to the most primitive manifestations of the will in the individual and the race — to pure awareness without any knowledge about. But this purely instinctive and impulsive manifestation of interest is, so far as our own adult experience is concerned, purely hypothetical. We can only observe it inferentially in the first stages of mental history. For our introspection, the attention situation has a large intellectual admixture where the physical factors are fused with the strictly mental in the associative interest patterns of memory and imagination.

Not only are there present in the attention context the stored up and associated sense data in the way of ideas; but certain immediate sense data in the form of organic sensations, particularly the motor and respiratory sensations, also enter in as an integral part of the fusion. So prominent are these that some psychologists, like William James, have found the basis of the consciousness of mental activity in the motor sensations from the forehead, throat, etc. James has gone so far as to say that the only subject identifiable in our various mental states is the "I breathe": "Let the case be what it may in others, I am as confident as I am of anything that, in myself, the stream of thinking (which I recognize emphatically as a phenomenon) is only a careless name for what, when scrutinized, reveals itself to consist chiefly of the stream of my breathing. The 'I think' which Kant said must be able to accompany all my objects, is the 'I breathe' which actually does accompany them."[1] Doubtless it does, and it is a conspicuous element in the situation so far as our introspection is concerned. But what figures in the foreground of our introspection is not necessarily the most important factor for understanding the situation. While the "I breathe" accompanies all our thinking, it does not give direction or motive to it. This must be found in the will.

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[1] "The Problems of Philosophy," pp. 137, 138.

In attention in its highest stage of organization — that of disjunctive weighing of alternatives — both the ideational objects and the concomitants of motor sensations have their maximum prominence. But here, too, the conative tendencies furnish the motives; and the direction of the process is determined by the systematic will which just through the conflict discovers its real purpose, and pushes forward to its realization.

Mental acts, therefore, as they reveal themselves in the attention situation, disclose the character of mind in an unmistakable way; and they disclose it as will. Of the will thus manifest in action there are two dimensions — attention and affection. We cannot identify these, as has sometimes been done. Attention is, at any rate, logically prior to affection. There must be the releasing of tendency, "the catching of the attention," before its movement towards its realization can be felt. Moreover, in automatic attention, affection sinks to zero. Attention is the energetic relation of a conative constitution to a stimulus. It is analogous to selective action as we find it throughout nature, and in the absence of consciousness. The affective tone reënforces or checks the release, not by acting upon it, but through the awareness of its success or failure in realizing its end.

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[1] "Essays in Radical Empiricism" (Longmans), pp. 36, 37.

If mind is will, conative constitution, we must bear in mind, on the one hand, that will reveals itself in various stages of complexity from blind instinct, through impulse, desire, and wish, to organized character. We must not, with Schopenhauer, strip the will of all but its blindest stage. It has its own capacity for development and for conservation of results — its own *Karma*, not only as regards possible future existences, but from moment to moment of this existence. On the other hand, we must not lose sight of the fact that it is only as the will figures in certain physical and social continuities, — operates through the tools of physical processes and deals with physical contents for the sake of common understandings, — that it comes to know its existence and properties.

The tools by means of which the will operates on the instinctive level are organic structures. These have the advantage, once having been established through survival selection, of being definitely adapted to certain situations. But the difficulty is that it requires a long and costly process to establish them — a process in which the race alone counts, the individual is sacrificed. And, again, having become established they are stereotyped; they cannot meet radical changes of the environment.

As instruments for action, therefore, the will needs to supplement the organic tools of instinct with more economic and adjustable tools. In doing so, the will also liberates itself more and more from the body, and becomes conscious of its own reality and value. Adjustment by organic habit is more economic than organic structures; memory images vastly shorten the process; and abstraction with its artificial symbols and its material tools gives the will the maximum of efficiency as well as the greatest freedom of activity and sense of realization.

We have thus seen that the will is dependent upon physical instruments — hereditary physiological structures, physiological habits, and upon the physical qualities which go to make up the content of images, and largely of abstract thought. These tools, enormously important as they are for the will, are not to be confused with the will itself. They are not mental at all. Where the will manifests itself is in the conative tendencies which give intent, motive, and cumulative unity to the self's operations. And wherever interest figures as part of the cement and leading, there is the will proportionally prominent and efficacious. The adaptation to ends is largely physical in the case of instinct; it is less so in learning by habit, as here the success of the conative tendency helps to fix the habit by its effect on organic processes. In perceptual fusion and contiguous association, interest, somehow, is an essential condition in establishing the habitual linkage; in association by similars its selective agency is still more prominent; and in ideal construction the physical processes become obviously instrumental in the realization of a free self-conscious purpose. While instrumental, however, the physical staging of the will remains nevertheless important in supporting the freer superstructure. Physiological habit and contiguity remain necessary means of conserving the selective results of experience for further use, however much the will may intersect and select within the habitual connections.

So far as the modes of the will are concerned, these can only be known as they unfold themselves in its selective reactions. Each instinct reveals a fundamental mode of will — a theme which is organized in ever greater complexity through its racial and individual development. It becomes the will to live, the will to own, the will to enjoy, the will to sympathize, the will to know, and so on through its varying and complex *motifs*. If the will is dependent upon a physical world and its contents for its realization, it is in turn the reaction of the will which makes the meaning and value of life possible.

As an energy the will resembles fundamentally other energies. It must be known through its effects in definite situations. It is to a large extent practically predictable. Like other energies, it possesses inertia. It requires a certain amount of stimulus — either a physical shock or an inner rhythm — to arouse it. Being roused, a certain energy must be taken away before it subsides into rest. It is a definite quantity: a greater emphasis in one direction means the withdrawal of interest in other directions. Will energy bears definite relations to other energies, even though we find difficulty in reducing them to exact quantitative measurement.

In answer to the question: What is mental? we must say, then, that the will in its various stages of organization is mental, and with it is bound up its pure affective tone of agreeable or disagreeable. The remainder of what we speak of as in the mind we must regard as physical. In order to be known, the will must figure as a living activity, as part of the context which we call subject in the subject-object relation. It includes in its apperceptive activity an associative context, but this is energized or set, in a unique way, by the dominant tendency. Associates, contents, whether physical contents or the will's persistent tendencies and results may figure as part either of the subject or object, but not the unique activity of the will itself. Destroy this, and you destroy mind. This is the real core of the ego. It is not an occult substance, but an energy which is known through its effects on other energies, and which thus knows itself. The situations in which the will discovers itself are intersubjective relations where will confronts will in the tension of common problems.

I cannot agree with Stout that conation and feeling are not merely known through experience as a tree may be, but are themselves experiences.[1] While *feeling* is doubtless bound up with certain organic excitements and with consciousness, I cannot see that the case of the will differs fundamentally from that of the tree so far as experience is concerned, except in so far as the will may figure in the attitude of knowing, may be conscious of its own procedure. The tree so far as we can see can be only object in the experience relation; it cannot be subject. Neither, however, is created by being experienced. Experience is only another name for the unique relation which we call interest; and I cannot see why the will is dependent for its existence upon noticing itself, or being noticed perhaps by another will, any more than the tree is thus dependent. The will discovers itself through the same energetic relations as it discovers things. It is only as it enters into the interesting situations that it becomes aware of its own existence or experiences itself. And then it discovers itself only piecemeal, as it discovers things piecemeal, in different situations. It is not conscious of its whole self in one act. It has many properties, and these are often contradictory and inhibit each other.

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[1] *Arist. Proc.*, 1908–1909, p. 244.

If it is surprised at the novelty in the situations which it faces in the world of objective reality, it is no less surprised at the new instincts, tendencies, and meanings which come to light within its own constitution. Experience is but a relation into which the will enters and where the light of consciousness is thrown upon it.

V

When we come to the *identity* of the self, we must hold that the self, like physical things, is just as constant as we can take it — as constant as its activities and contents; as its ability to satisfy social expectancies. What is the use of assuming, beside this constancy of the stream of consciousness, an external entity to make the process constant? Such an entity is obviously an afterthought, an hypostasis of the fact of constancy itself. It makes the processes neither more nor less constant than they actually are in the flow of experience. As the organic sensations constitute a constant background in the changes of mental life, they play an important part in our consciousness of identity. They furnish largely the warmth and tone of personality; and disorganization of these sensations produces serious disturbances in our sense of self; yet to furnish the *meaning* of identity, there must also be certain constant tendencies, which furnish the leading or active thread of experience in the panoramic and shifting scenes of feelings, perceptions, and ideas.

Kant is quite right that the consciousness of succession is a different fact from successive states of consciousness. But it does not follow that the consciousness of succession requires any transcendental unity outside of the stream of experience. The consciousness of succession means that a relatively permanent system of tendency, in order to realize its will, must take account of the coming and going of contents — must emphasize the constant as over against the fleeting in order to establish definite expectancies. What furnishes the pragmatic substance is precisely this core of permanent tendency and associations in the midst of the flux. What is the use of duplicating this identity by assuming another identity to account for it and so on *ad infinitum?* Why not take the constancy of the processes, so far as such constancy must be acknowledged, at its face value?

Constancy and change are both facts that the will must acknowledge in the process of experience. There is the relatively permanent will, the invariable associations; and there is, on the other hand, the shifting of contents and values, the new experiences, the unforeseen obstacles, the pleasant surprises. Why not take experience as it is? But this is not human nature. Our tendency is to emphasize some aspect of the whole and neglect the rest. For instance, you must admit that there is constancy in experience. If that is the case, one argues there must be absolute constancy. In and through the states, there must be an eternal self, a transcendental substance, which remains identical in all the states. And the changes themselves are merely accidents of this eternal substance or character. And, on the other hand, there is change. Our mental facts come and go. Very well, then there must be absolute change. There can be no constancy if there is change. Each gross moment is really divisible into infinitesimal changes. And everything must necessarily flow through these infinitesimal transitions. There is only appearance of qualities or tendencies, but really there is this absolute flux. Does the attention vary? Then the contents attended to must vary also. Do our ideas vary? Then our will attitudes must vary too. Such is the manner of reasoning the human mind from age to age has employed; and new editions are appearing all the while. But what we must not forget is that the conception of an eternal self, on the one hand, or of the calculus of flux, on the other, are merely tools with which we work. Their authority in the end can never rise above the facts from which we have derived them. The contents and tendencies may overlap our ideal divisions. All we can say is that in the history of the self there is change and growth and novelty, but there is also some constancy. Else we would not even be talking about flux. There would be no memory or expectancy. We must learn to recognize constancy in so far as there is constancy, and flux in so far as there is flux.

Just why there should be such a mystery about the continuous occurrence of a relatively stable context, taking account of a series of successive feelings or perceptions, it is hard to see. But such has been the feeling of others besides Mill: "Accepting the paradox that something which *ex hypothesi* is but a series of feelings can be aware of itself as a series. . . . I think by far the wisest thing we can do is to accept the inexplicable fact, without any theory how it takes place; and when we are obliged to speak of it in terms which assume a theory to use them with a reservation as to their meaning."[1] Yes, perhaps. But would it not be wiser still not to invent such an absurd paradox? The series of feelings does not as a series know itself, but is known as such by a context of interest which is for the purpose stable. And, again, while our ability to control the series of feelings, so as to keep them in the focus of attention, may be circumscribed by a few seconds, it is not necessary to suppose that the interest in controlling them is so limited. The dominant tendency, the ruling passion, may be lifelong. To measure the real permanency of the self by the flicker of attention, whether we have recourse to the infinitesimal calculus or finite fractions of seconds is equally mistaken. The real specious present is just as long as the associative interest, determining the series of events, whether we attend to such interest or not. The time-span of the self and the time-span of attention should not be confused. As a matter of fact while attention flickers we can bring back again and again the contents and will attitudes.

The past is not made by the consciousness of it any more than the present. You might just as well say that the geological strata originate with the consciousness of them. The past has its own context and its own content as much as the present. The past comes to have significance for the present moment, when it is attended to; but its own meaning does not originate then. If it did, there would be no possibility of knowing the past, because there would be no past to know. The context of the past must somehow persist and be acknowledged by the present, if we are to have a past. Else there could be no memory. Take the simplest case of recognition, ideal or perceptual. Part of the past content must figure as a content in the present context. This content in definite recognition reinstates its own past setting, be it the sensory context of the perceptual object or the ideational setting, which is acknowledged by the present context, including the dating. There may, of course, be all degrees of reinstatement, and so of vagueness of recognition, but in any recognition a past content must figure as the identical content in the present context together with its own tendencies. In this unraveling of the past context, there is also the more or less vague intuition of pastness, due to the growth series of which the contents are a part. Sometimes an identical content plus this feeling of pastness is all that figures in the present context, and we have the confusion of feeling that we have been in the same situation before, when we know we cannot have been there.

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[1] J. S. Mill, "Examination of Sir Wm. Hamilton," 4th ed., 247 ff.

In purposive realization, we have a similar illustration of constancy with reference to the future. If ideals could not persist, but were new every moment and in each infinitesimal fraction of a moment, there could be no such thing as the realization of an end. Experience would be one immediate slough without direction. The facts of experience, however, show that we can keep a constant nuclear aim, however much the context of our meaning may grow in extent and definiteness in the process. There remains an identical constellation of content through it all. And so ideal realization is possible.

It is true that we depend very much upon symbols in retaining the past and in fixing the present and the future. Knowing our own meaning, past and present, as knowing those of others, is largely an interpretation of language. But language after all is only the symbol of the contents of experience. Language could not convey the same meaning, unless we owned the meaning. We can recall blue sky when we perceive the words, because we have the actual meaning blue sky, however fragmentary its concrete content. And failing this, as in an unknown tongue, we would simply have words staring us in the face, conveying nothing. Language, moreover, is discrete and stereotyped and fails to give an equivalent for the quivering transitions that persist indefinitely within the systematic meaning. It is not fair to substitute the tool, however important, for the living reality.

But, we shall be told, the real persistence is not of the contents themselves but of brain-processes. We have elsewhere pointed out the absurdity of supposing that our mental contents are converted into atoms and molecules, when we are not attending to them or still more that they should disappear into nothingness to be magically recreated. All that the brain cells can do is what the phonograph or the camera or the written page does for our senses — furnish a record of experience. But just as the mind must furnish the real content for the written page and the other sense records, so it must furnish the content for the brain record. The brain record no more makes the content than the words on the page. And if the brain record *means* a constant record it must be because the content is recognized as the same. As a matter of fact, owing to the uncertainty of the brain record, we substitute largely the ink record which is both more reliable and socially more available. Whenever, then, we have the meaning of identity and not bare physical identity, there must be the identical will. Through the process there must run the silver thread of persistent tendency. That is the real currency of which the records are the symbols. That we are immediately aware of the brain record and only through the senses conscious of the ink record does not alter a particle the significance of the records. When we read the ink records, we do not read the retinal fibers or light rays; we interpret them as symbols of content, just as much as though they were written on our brain by the law of habit.

The mental energies have their own laws of spreading and becoming ineffective as shown by the researches of Ebbinghaus. Sometimes our associative contexts become dissociated; and, when they do, no transcendental ego breaches the gap. Memory and recognition operate only when there is constancy within the *referent* context. The other contexts, the *relata*, can suggest neither sameness nor novelty, unless there is such constancy in the subject. How far the inefficiency is due to records can be ascertained by the fact that when an objective record is present, visual or oral, the contents are reinstated even when the brain record is ineffective. This fails when there is real dissociation of the context of meaning.

We must, finally, remember that the constancy of the individual meaning is determined not merely by the individual himself, but by his social context of relations, which reacts upon his own consciousness and with reference to which constancy and flux alike become practically significant. This social context of judgment with its records must determine how far the individual feeling of identity can be trusted. The individual meaning sometimes judges itself to be constant, when the social verdict is otherwise. And identity has significance primarily as a social category.

VI

The *unity* of the self is a question distinct from the subject-object relation. Whether the self functions as whole or part, there is, whenever it is awake, the focal and marginal field, the active context, and the selected content. This is true even where there is complete dissociation of associative systems. Leone II, when awake, has just as much the I-me character as Leone I, however distinct they may be as regards associations, temperament, and character. To what extent, then, the experiences of one organism hang together must be treated as a problem by itself.

The self has as much or as little unity as we must recognize. We must take unity precisely as we are accustomed to take difference — at its face value. And here again no *a priori* assumptions will either increase or diminish the unity which we find in the actual processes. As a matter of fact, a transcendental ego or soul, or any other additional entity, spiritual or material, simply becomes one fact more to be related to the rest; and if we dogmatically deny unity to the facts themselves and treat them as purely unique and disparate, no external linkage will serve as cement to bind the hypothetical differences together, not even in an infinite series. The processes cannot be unified by being "in something" external to themselves, material or spiritual. They must possess their own linkage.

The dogma that each state of consciousness is unique and indecomposable is as indefensible as that of a transcendental knower relating disparate facts. There could be no judgments in an experience where the facts are so intimately blended that the experience could only be taken as a whole. All our thinking depends upon our ability to analyze out identical qualities or relations and to pass from one context to another on the basis of such abstraction, dealing with the contexts only so far as the identical predicate pertains. As a matter of fact, actual experience shows that we can take objects and qualities now in one context, now in another, without altering the object by thus subjectively taking it. The content yellow when transferred from the marginal to the focal field of *attention* is not altered in quality, whatever may be the difference of moving it from the marginal to the focal field of *vision*. We can know the past, we have seen, and we can prepare for the future, because we can take the contents and their contexts over again without altering their own meaning or reality in so taking them, however much their significance for the cognitive contexts may be altered. The dogma of the uniqueness of each state of consciousness as such contradicts all our procedure and would make not only the science of psychology but any science impossible, for all science presupposes the possibility of taking facts over again in experience.

There are doubtless unities in experience which fulfill a unique purpose and which as individual unities cannot be exchanged for other unities. But why, therefore, give our entire experience this character? And even when a whole has uniqueness, it does not follow that the elements cannot be analyzed and taken over again indefinitely. Unique as the Angelus is as a painting, the elements of color, perspective, and form can be analyzed out and can figure in any number of contexts. The composition is not unique in its elements, but in the *will*, which they express through their correlation and which furnishes a specific satisfaction to the appreciating subject.

Absolute uniqueness, like the absolute ego, is a dogma unsupported by facts. Why make knowledge impossible by assumptions? If experience came merely by unique throbs, prediction and knowledge would be impossible. If it consisted of wholly diverse contents, knowledge would likewise be impossible. But to some extent we can have prediction, we can pass from fact to fact by means of identities in the stream of processes. Let us take as distinct what experience makes distinct, and what experience joins together let no man's assumptions put asunder.

If we insist on abstracting from the processes of experience altogether — from its active context and its selected datum — in order to discover something which is not process at all but which is superadded to the activity of the self, we get not a transcendental ego or any other common entity outside of the process, we get the fact of consciousness in the abstract which accompanies all our apperception. This is not a spectator. The spectator of experience must be the apperceptive context. It is merely the condition of awareness at all. It is quite colorless. It is responsible for neither diversity nor unity. It holds together as little as it separates. It simply makes the facts apparent. It is not necessary to give consciousness an individual existence for each knower as is done with Purusha in the Sankyah system. The individuality belongs to the processes themselves, in their phylogenetic and ontogenetic history. Consciousness taken as an abstraction is homogeneous.

Sometimes we must recognize the self as partial. It may be a case of impulsive control where the total context of tendency fails to express itself. We then speak of ourselves in retrospect as not being ourselves. It may be a dissociation of memory, which makes us fail to connect with the past and so carry out our obligations and satisfy expectations. It may be organic disorder which makes one part of the contents, previously linked with the self-contents, seem foreign altogether, with altogether strange properties. It may be a case of more profound dissociations, where dirempted systems of association, each with its own characteristic tendencies, simultaneously or alternately struggle for the mastery. In all of these cases the contents thus dissociated may come to figure again, after restored equilibrium, in a total context with its characteristic consciousness of identity. But, in any case, we must accept the actual association or dissociation as it is.

Even when the facts hang together, they do not hang together in the same way. There are different grades of unity. This has not always been recognized. Because some facts hang together systematically as parts of a purpose, it has been argued that the self is fundamentally a thinking or rational self and that all mental activity is implicitly or explicitly of the judgment type. The realization of an ideal self, then, becomes a case, not of empirically selecting and composing a unity in obedience to a purpose, but of becoming conscious of an eternal self already constituted and implicit in our simplest mental acts.

Again, because some facts apparently hang together in our attention moment only externally, in space and time, with no seeming internal bond, but are simply interlinked by contiguity within the field of interest, it has been argued that habit or contiguity is the only real linkage of our mental facts, with similarity given perhaps a more or less vague secondary place. Or, perhaps, the opposite: since similarity of content is sometimes found to be the seeming linkage, contiguity is made a case of similarity, if the two are not simply held out as irreducible laws. This external linkage, moreover, has generally been credited, not to the side of mental processes, but to the account of brain processes. Our ignorance of brain dynamics and the paradox of cementing feelings and ideas by means of atoms and molecules and their habits has not discomfited physiological psychology.

Now here again we must take connections at their face value. In part, evidently, the facts of mind hang together as members of a system. They cohere and are controlled by an identical purpose — utilitarian, logical, æsthetic, ethical, or religious. It may be the idea of wealth; it may be the pursuit and creation of beauty; it may be the love for truth; it may be the passion for righteousness; it may be the imitation of Christ. The ideal self is no doubt the self unified within a comprehensive purpose, where all claims are adjusted, all facts seen in systematic relation. But for us finites this unified self is largely an aim and only in part fact.

The linkage sometimes is the consciousness of a common quality or relation by means of which the otherwise seemingly heterogeneous facts or contexts hang together. Thus consciousness of a common quality may bring together processes which have never been experienced together and so is quite a distinct and elementary fact. In every case of recognition, however rudimentary, this consciousness of the partial identity of traits of one individual or context with another is present. This, in the case of the judgment of analogy — the building of expectancies upon identical traits — forms the transition to the reading of facts by internal connections rather than by adventitious. That one individual or setting is merely like another is an adventitious relation. It is when the identity links them in a system of prediction, that we have science.

The loosest or most adventitious bond is that of habit, the contiguous interest in facts merely happening together in space or time. The overlapping part of one context tends to reinstate its other context or one of its other contexts in accordance with the strength of the habit so established and the dominant set at the time. The set of active tendency acts like a switch system, making some habits effective and others ineffective for the specific purpose.

Whether the linkage be through a systematic purpose or through similars or through habit, in any case the linkage is due to the consciousness of identity in the variety of facts and contexts. There must be at least the bond of unitary interest, whatever may be their own linkage of the facts themselves — the identity of the context which takes account of the facts, fleeting and heterogeneous as these facts may be. While a great deal of our mental life is held together by such contiguous interest, we must not forget that it is precisely in the mental world that we can follow the transitions from fact to fact and have the immediate consciousness of their string of identity, *i.e.* wherever we have purposive unity. Outside of what appears to be mind we must be satisfied to piece out the transitions conceptually and inferentially. We cannot follow immediately the transitions of the facts. It is a mistake to ignore these internal transitions of the mind and to strive, as modern psychology has done, to reduce the relations of mind to the adventitious and external kind. Purposive unity must be recognized together with passive association by similars and by contiguity as an actual type, as well as an ultimate ideal, of mental connection.

VII

What becomes of *activity* and *freedom*, if we once admit that the stream of tendency is the agent? No theory can unmake the facts and such activity or freedom as there is still remains. It is hard to see of what use a transcendental knower or any spiritual something could be in accounting for activity or any other function of the self, as it must necessarily be the same whether the self is active or passive. Activity, as contrasted with passive and non-voluntary states, would still have to be stated in terms of the concrete processes, though somehow it is hard to rid ourselves of the feeling that the idea of an extra entity, added to the facts, affords an additional guaranty of identity, unity, and freedom.

Activity has sometimes been identified with the unpredictable and novel. The world of psychic reality, it is rightly pointed out, is not exhausted in our concepts. It is not all included in our present logical context of meaning. One characteristic fact about the stream of consciousness is its ever novel situations and novel attitudes. You cannot except partially predict the future. But however true this may be, as stating our finite experience, and however much we may recognize the truly temporal aspect of life, it does not seem possible to define activity in such terms. For change and novelty exist apart from our activity. They confront us whether we are active or passive, awake or asleep. They may come to thwart our purposes as well as come as the fruits of our efforts. I do not see, therefore, how we can define activity or freedom in terms of novelty.

Activity and freedom must mean the realization of an aim. And we cannot aim at the unpredictable. We can only wait for it and let it happen as it may. Activity on the contrary means the control of events — ideas, feelings, perceptions, impulses — by an idea which remains constant. It is just this conscious leading that we, in our awake moments, mean by the self. That the novel and unforeseen happen is incidental to the activity and may be forced upon us quite independently of our being active; though a general readiness even here is the thing, in turning the novel to our advantage when it comes.

Activity means that the consequences follow from our intention, not contrary to our intention.

Activity, therefore, is the very opposite of chance, which means the unpredictable and uncontrollable. Fluent our world must be to some extent to have expectancy, to look to the future; and with the fluency there may be novelty. Perhaps there always is. But freedom relates to making real the ideal content, to regulating the flow in accordance with the dominating purpose. Only when the idea can recognize the results as its own fulfillment, however much more definite and concrete, do we have freedom. Whether the flow in such a case is determined altogether by "considerations," or whether it is to some extent independently variable, does not concern the question of freedom, since we are free only in so far as the flow *is* controlled by the purpose, *is* organized into some ideal scheme of life. The novelty, as we finites can take account of it, is necessarily an afterthought, a gift of the process, and by hypothesis it is not anything we can theorize about. It is a character of the concrete flow, as contrasted with the expectant and guiding idea. Whether it is absolute novelty or due to the peculiar limitations of our experience it is difficult to know. Some of it is evidently due to the limitations of our finite consciousness, where we often discover that what is novel to us as individuals or even as an age is already part of the content of historic humanity. The novelty of the child, to whom all is novel, is merely its taking over of the content of the race, in terms of its own specific organization. But while novelty abounds in the infant's life, there is no freedom. Conduct is free only when it is a consequence of a systematic purpose. We do not call a man free in so far as he must say of the outcome of his conduct: "That is not what I meant" or "I had not thought of that."

There has been a tendency of late to minimize the importance of the focal factor in attention. A new light has been thrown upon the complexity of our mental life by such researches as those of the Freudian school. More emphasis is being placed upon the dimly conscious or even unconscious impulsive background than upon the intellectual constellations which occupy the foreground of our conscious field. The real motive springs must be sought, it is held, in the deeper impulsive strata, rather than in the shuffling of ideas. It is this impulsive background which furnishes the real determinants of interest and conduct. Sudden crises in our emotional and volitional life have been explained by the subconscious incubation of tendencies which gather strength, often unbeknown to the habitual stratum of consciousness, until, sometimes under some special stress, sometimes by their own cumulative energy, they break through the crust and establish a new center of emotion and volition.[1] In such cases, self-surrender, rather than ideational control, seems to be the secret of the establishing of a new equilibrium, with its characteristic consequences of value and conduct. Needless to say, the new level of interest may mean retrogression as well as progress, counterconversion rather than conversion, from the point of view of socially established ideals. In either case, the change shows that there are more things in heaven and earth than are dreamt of in man's intellectualistic philosophy. Valuable light has been thrown, in many cases, upon socially pathological emotions and conduct, as well as physical disorders, by psycho-analysis through its unearthing of balked dispositions. It is true that the Freudian School has placed a one-sided emphasis upon sex dispositions both in explaining pathological and normal behavior. Other primitive impulses, such as self-seeking, fear, anger, etc., are equally original, if not equally pervasive, and must be taken account of both in their normal and pathological aspects. The ideal tendencies, too, as shown in religious conversion may be the balked dispositions. But in any case, the new exploration of the subconscious has disclosed the limitations of the intellectualist psychology of mechanical associationism.

Without minimizing the importance of the discovery of dissociations in the strata of our psychic life, it is true nevertheless that, in the stream of the self as known to most of us, there is an interlinking of dispositions in our waking experience. The subconscious is here the more which furnishes the basis of movement and interest in a one-story structure, more or less loosely organized. Here, too, what we are distinctly conscious of in the way of snatches of ideas, perceptions, and feelings floats on the larger stream of the subconscious life with its associative and impulsive tendencies. But though the conscious part may be only a tenth or hundredth part of the total stream, it is nevertheless important in the steering. Work of moment does not get done, unless there is the attention to plans and ideals. Valuable results come to us from the subconscious only when there has been a previous set established by conscious effort. Most of us are not saved from uselessness and chaos by self-surrender, but rather by active attention which makes certain tendencies focal and meaningful until our life becomes fairly thoroughly organized in terms of such ideals. Activity and freedom still continue to mean the steering and control of the multitudinous impressions and impulses by means of purposes, fragmentary though our consciousness of their implications may be.

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[1] See James, "Varieties of Religious Experience," Chapters VIII, IX and X.

VIII

Finally, the dynamic theory of the self explains the *value* and *worth* of conduct in so far as it possesses those characters. Any abstract entity added to the processes would as little account for the presence as the absence of value in any specific process. Value is a function of activity. Objects have value when they satisfy some tendency of the self, in its various stages of complexity and equilibrium. As every satisfaction of the will is a value, we must distinguish between value and worth — subjective value and objective value. Whether activity has worth or not does not depend upon its individual satisfaction, but upon its agreement with a standard which the will must acknowledge. It may be the standard of social agreement; and this at any rate is enforced upon the individual will, whether accepted by it or not. But as this also is variable, our finite activity, in order to have worth, must refer to a standard which the social will, too, must accept in its racial development. The meaning of this we can only catch gradually, and every such advance in meaning must come from individual insight.

As the agreement of activity with an objective standard is worth, so, if there is an ultimate and eternal standard, agreement with this standard means immortality. As society conserves the unities which harmonize with its standards, and makes the poem, institution, or individual that expresses its will immortal, in so far as in it lies, so, if there is an ultimate standard and a will to enforce it, this will must intend the immortality of that which realizes the standard, be the unity personal or impersonal. The worthless unities could not, in such a world, survive as individual unities, they could only survive as contents or tendencies to be used as raw material for more comprehensive unities, as the button molder in Ibsen's "Peer Gynt" melts up the sham individuals in his ladle.

Since so much of what enters into our mental processes, both in the way of content and in the way of associative mechanism, is physical, it is a question whether such elements and contexts can survive the shock of bodily decay. The real continuity of mind may have to be thought of purely in terms of the will — its continuity as an energetic complex, with its stored-up effects and its organized character. This conception of continuity is that emphasized by the Buddhist conception of *Karma*. Thus to conserve the moral results would indeed make immortality a practical reality. Ideational memory and association may well be looked upon as machinery, existing for the time owing to the mind's conjunction with a physical body and valuable as instruments in the development of the will, in order to make effective its capacities for docility and refinement. If we limit memory to "organic memory," to the retention of motor results which can guide the future process of development, there is no reason why the will should not be accorded memory. Such memory must indeed be attributed to the hereditary stream of cells which condition the unfolding of every complex life history.

We may thus look upon the coarser or finer qualities, native to the minds of human beings as we know them, as the result of such immortality on the part of the will looking backward, though conceived perhaps in racial rather than individual terms. To have this greater capacity for truth, for beauty, for uprightness, and for friendship would indeed seem an immortality well worth while. It marks the quality of wills now and may so continue forever to mark their quality with ever greater possibilities.

Of course the persistence of an individual will would mean, not merely the persistence of conative tendencies, but the persistence of a certain organization, a certain form quality of the whole which marks a unique personality, as it marks the unique harmony in music. Such organization of character shows a remarkable durability in our present life history, and does not seem to be dependent upon the changes of the physical organism.

Even in the case of the physical content and its habitual associations, it is, of course, possible that these may be so intimately woven into the character and unity of the will that they can exist independently of their particular physical conditions. Like a diamond set in gold they may persist inlaid in our interests. This is more difficult to conceive, though our faith here in bare possibilities may be aided by direct results from the despised science of psychic research. Nothing indubitable would seem to have been arrived at up to date, though some distinguished investigators feel otherwise. Further research may here, as in other fields, bring greater agreement.

At any rate such conceptual dissociation of mental energy from its temporary physical conditions, will give faith a freer play to construct its belief world as may be consistent with our hopes and happiness. Where we know so little, it is important that our conceptions should not trip up or block some of those deeper yearnings of humanity, which certainly have tremendous social and race significance, however incapable they may be of scientific proof. The craving for immortality remains at any rate one of the most stubborn and perennial demands of the will. As the will becomes conscious of its reality and dignity, it naturally becomes solicitous to shape a conception of the world which shall furnish a congenial climate to its brief conscious awakening in the time process.

CHAPTER XI

INDIVIDUAL AND SOCIAL MINDS[1]

WE have spoken so far of mind as though it were made up of individual streams, in more or less abstract isolation from each other, each bound up with its own organism. We have become accustomed, thanks to the sharp abstractions of science, to look upon mind as subcranial. We cannot, however, in my opinion solve this difficulty of abstract isolation by getting rid of mind altogether and by substituting for it organic reactions. Mental behavior is not mere physiological behavior; and adding the *quale* of *interested* organic behavior merely introduces the problem of mind through the back door. For we must still define interest. This is no mere neutral light as we have seen, but an energetic reaction between the will and a stimulus. The stimulus may be physico-organic; it may be internal to the will's own rhythm; but it may also be another will. It is the relation in the latter case with which we are concerned here.

In assuming, as psychologists have done in the past, the isolation of minds, the relations between minds have necessarily been regarded as external relations. The continuities between minds have been assumed to be physical continuities, unless in some "spooky" instances of telepathy. We become conscious of other minds, it is supposed, only through analogy from physiological conduct, *i.e.* we represent to ourselves that other people have minds from the similarity of their bodily behavior to our own, assuming, of course, that we have knowledge of our own minds from the start. By imitating other people's behavior, including in later development their words as well as their instinctive sounds and gestures, we learn to translate more fully the hidden mind of the other egos into terms of our own and so to share to some extent a common world. What is thus directly shared and common to minds is the physical world. With this each of us has immediate continuity. This distinction between mental and physical, modern psychology has crystallized into the formula that physical facts are those which are objects to several observers while mental facts are objects to one observer only. The former furnishes, therefore, the world of description, the latter is only accessible to private intuition.[1]

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[1] For a fuller treatment of the social mind, see the author's articles in the *American Journal of Sociology*, 1913, 1914, 1915.

Why this precedence should be given to physical continuities is not easy to understand from the point of view of logic, though natural enough from the point of view of custom. The material world has been too much with us. Early and late, through a long survival struggle with the sense environment, we have been directly dependent upon it for our immediate wants, while conscious coöperation with our fellows and the treatment of them as anything more than things — breathing bodies — is comparatively late and not over-widespread now. In the lowest animals, mind seems entirely enslaved to the organism and its needs. Blind impulse and habit seem here indeed a part merely of organic behavior. In the higher animals the free association of ideas, the division of labor and coöperation for common ends help to liberate mind from this instrumental relation to the body until in civilized man, with his power of abstract thought, the relation is reversed. Body comes to be the instrument of mind, and the individual's world of ends comes to be found more and more in social companionship, in the mutual coöperation and appreciation of his fellows. This common bond comes to be looked upon more and more, not as a mere artificial contract but as the fufillment of spontaneous and fundamental needs. A world of spiritual relationships thus arises where the individual lives and moves and has his being, and, compared to this, the solid physical world, through the progress of science, comes to seem more and more a plastic means.

This mastery, however, is made possible only by means of abstract thought; and abstract thought, indispensable as it is to this process of liberation, carries its own penalty. It tends to make us insensible to the immediate continuities of life. It cuts the world up into abstract elements. It atomizes its integral situations for descriptive purposes, and then unconsciously substitutes the instrument for the concrete interrelations of the real world. Thus conceptual thought, the most efficient of social institutions, kills the sense of social continuity and reduces mind to a mere abstraction. Its relation to its world becomes a mere external relation, at the same time that the objective world is itself broken up into abstractions and external relations. Incidentally, thought, when thus cut loose from those concrete purposes of experience for which it is to furnish the leading, makes itself impossible and absurd. A world made up of abstractions is no longer conceivable; and so thought in despair comes to discredit itself and to seek solace in mysticism.

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[1] This contrast has been most clearly emphasized by Professor Münsterberg in his "Grundzüge zur Psychologie."

It is one of the paradoxes of human development that conceptual thought, the social instrument by which mind dominates matter and secures efficient coöperation of mind with mind, should thus in theory have come to isolate mind in the universe, if indeed not to make it a mere function of matter. But this is not all. Thought has similarly emphasized its abstract substantives in our social relations and made us correspondingly forgetful of that sense of immediate companionship of mind with mind which furnishes the propelling motive of social coöperation, including abstract thought. Not that thought has destroyed the sense of companionship. Constructive imagination does not make men selfish, as some suppose. By liberating mind from the immediate sense world, it has vastly enhanced both the need and the reality of spiritual association. It has made possible the relationship of friendship, the freest and most precious of social communions where man rises above, not merely the slavery to animal want, but traditional bondage as well, and where soul meets soul on the basis of lasting ideal kinship. There are compensations. But the atomism of our thinking is both effect and cause in the realm of practice. While originally the effect of the narrowness of our human interests, it in turn crystallizes and tends to justify and perpetuate our social atomism. This defect can be cured only by a deeper thoughtfulness, when thought recognizes its instrumental character and examines its deeper, though often unconscious, motives.

Perhaps Bergson is right that the higher insects with their concrete intuitive life and their lack of abstract thought are more keenly conscious of the real continuities than we are. But at any rate they don't know it if they are, while we can with an effort at least call back thought to its original task of making clear and distinct our concrete intuitions.

We thus, in the process of experience, literally differentiate ourselves out of a social continuum. In this process of differentiation, in this growing recognition of each other's reality, the combative instincts play the most important rôle. We are no sooner brought together by the irresistible pull of gregariousness than we like children fight to possess the same things; perhaps we fight for physical things, perhaps for the mastery of the social situation, perhaps to emulate each other in a self-imposed task. And in the fight we discover the mutual reality of wills and our relative place in the scale of valuation. The sense of companionship in the meantime which pulls us together and holds us together in spite of the conflict, and even makes us enjoy the conflict, is in the background of consciousness and is apt to be overlooked by the intellectual attention. It may seem as though we were together just to fight, to be an interference and torment to each other. We fail to realize that war itself however destructive, and however clumsy and primitive as a method of social evaluation, is a social process which "makes some gods, some men."

To sum up our brief genetic retrospect, we may say that while to start with, both in race history and individual history, the particular will is a rather blind function of an individual organism, in the growing civilized life of which we are a part the particular mind becomes rather a function of a social organization of mind with its necessary division of labor and free or compulsory coöperation. In this spiritual economy of the world we are literally members one of another.

If we succeed in recovering to some extent the innocence of that immediate experience from which all our abstractions are made, we shall find, I think, that the isolation of mind from mind is based in scientific prejudice, not in the intuited facts. The processes of external representation and analogical inference presuppose immediate social *acquaintance*, valuable though they are in our attempts to *know about* other minds. We do not start with a knowledge of our own minds and then eject it into other bodies, but we become conscious of being minds through our interaction with other minds. It is in meeting the other will, which thwarts and baffles it, that our own will awakes to its reality and claims. Except for this social interaction, it would remain submerged in the physical continuities, a mere function of organic conduct as we find it to be in the non-social animals. Our knowledge of social continuities starts, like all knowledge of reality, with certain intuited facts. The intersubjective continuities are first of all felt, and they are felt to be different from physical continuities. This fact is more elementary than the representation or inference of other minds; and is presupposed by these intellectual processes. It is because we feel the continuities with other minds and must adjust ourselves to them that we try to know about them. Our intuition of social continuities is as immediate and elementary a fact as that of physical continuities; and from the point of view of knowledge, it is the demands of the social interactions which lead us to *distinguish* between intersubjective and physical continuities. We could not, therefore, very well infer the former from the latter. The mind, whether conscious or not, exists always in certain dynamic contexts or energetic fields; but, so far as we know, it requires the unique tension of an intersubjective field, a conflict with another mind, to raise it to consciousness of itself.

The agnostic is at any rate consistently wrong. He does not hold that we have a true intuition of physical continuities, but are isolated as minds. He regards both continuities as subjective states. We thus live in a sort of middle world of phantasms, — a world neither mind nor body nor a copy of either, but a misrepresentation of both. Hence we can know no real things, we can trust no intuitions as regards either world. The pragmatic point of view, on the other hand, insists that we must start with our immediate intuitions and beliefs and try to make them consistent and clear. And one of those intuitions, is that of the first-hand and immediate character of social companionship. This for the mind, unspoiled by artificial abstraction, is as categorically convincing a fact as are the immediate sense continuities with the physical world.

What is there to set over against this convincing intuition of social continuities? There is an abstract body of secondary beliefs due to scientific theory. We still insist on applying the molecular conception of interaction to the relation of mind to body. To the old type interactionist, it means that mind somehow must be located within the brain and give a push to its molecules. To the parallelist such interaction is inconceivable and absurd, and the only relation possible is that of inert concomitance and miraculous correspondence, while the materialist caps the climax by ruling out mind altogether except as the bare abstraction of a neutral consciousness.

The mechanical theory has long presented similar difficulty as to physical interaction. This difficulty led Leibniz to deny any interaction between monads. It led physical science to discard the so-called secondary qualities because in their case the characteristic action of the physical stimuli was supposed to stop with the end-organs. Just how the primary qualities got past was not explained, but merely taken for granted; and the agnostics and subjectivists who were more consistent had no trouble in insulating mind from any outer physical world. Such was the logic of the old mechanical hypothesis.

Fortunately, we have come to know a type of energy which is not ponderable matter. The immaterial character of electricity was long obscured by our carrying over our mechanical models into the new field. The ether was invented with all sorts of contradictory properties to furnish a medium for this new energy. But whatever may be our belief as regards the existence of the ether, we have at any rate come to recognize that in electrical energy in its various forms we have a unique type of immaterial continuity which intersects and pervades the gross material framework in all sorts of ways. What is opaque to one wave length becomes translucent to another — to X-rays or violet rays. However difficult it is to accustom our minds to the properties of this immaterial energy, we have here a type of continuity of far greater subtlety than any known before, a type where molecular models cease to be applicable. As the discovery of free electricity has liberated the conception of this energy from matter, it is to be hoped that the conception of mind may also be liberated from the hypothetical models which have made our immediate convictions as to the continuities of mind with the physical world and with other minds absurd.

As electrical energy rides on material energy and is thus focalized in definite directions, while yet establishing its own terminal continuities, so we may conceive that mental energy rides on electrical energy and yet establishes its own immediately intuited continuities. Within our own body the mental energy seems to travel on the electrical energy of the nervous system. And why not on the electromagnetic field with which our nervous system is continuous? When we send a voice over an electric wire, don't we also send the mental impulse which gives character and persuasiveness to that voice and makes a will at the other end respond to it in a definite way? Are we certain that the will to send the voice stays in the brain? That we believe so is due, I believe, to an artificial tradition.

I do not care to go on indefinitely and work out possible analogies between mental energy and electrical. They will easily suggest themselves and may easily be overworked. We have no more right to transfer the electrical conceptions bodily to the mental realm than we have to transfer the material conceptions to the electrical realm. What I wish to emphasize is that the conception of electrical fields of energy and their immaterial continuities across space, intersecting our gross material world, seems to furnish a model which fits in with our unconquerable conviction in the immediate companionship of mind with mind. Let us substitute for the old conception of the soul as an indivisible, localized atom, the conception of a field of energy with its vague penumbral edges or spreadings and its more or less focalized and shifting center of activity, and we shall have no intellectual obstacle to dealing with our social intuitions.

Such a conception conveys no new information. This must be gotten from experience as before and always. It does not support a telepathic hypothesis except as social experience indicates such an hypothesis. Our social continuities become no less mediated by a nervous system, end-organs and an intervening physical world, whatever its constitution may be, than before. It simply insists that mental energy rides across and over these other energies and establishes real overlappings, true continuities in its own right and kind. Whether more direct and free continuities across intervening space than those so mediated are possible under conditions of high intensity and the special receptivity of the polar fields must be established by evidence; but if so established no intellectual model need discredit it, and we may admit that there is being accumulated a number of uncanny instances that may point to a telepathy of this more special kind.

When once we abandon the dogma of the insulation of mind somewhere in the skull, there are many interesting phenomena about human relations that may throw light on the activity of this mental energy. Just exactly what is it that makes people attractive or repellent to each other and sometimes the opposite to different people and to the same people at different times? What is it that constitutes the "atmosphere" of some personalities and the absence of it in others or that gives some a positive, others a negative "atmosphere"? What is that makes some psychically warm, others cold, and others colorless? Why do some people move us and others not, though the latter may have the better argument and the better cause? What takes place when we find a person animated in conversation? What happens when a person is radiant with joy and makes us feel his good cheer? What is the dynamics of contagion, be it of fear or courage? These are just a few of the questions of everyday social life which we shall be able to understand better when we are ready to accept the intuition of immediate experience that the will is an energy which radiates beyond any definite center; that when we meet in sympathy two fields of will actually blend; and *vice versa* that they repel each other when we are antagonistic. Thus love and hate become real first-hand interactions of wills of which the corresponding emotions are the reflex effects.

Language, gestures, and other sense symbols are merely the code for controlling the intellectual associations and thus making definite the meaning of mental continuities. They do not constitute the continuities. Common moods and common attitudes are possible without such symbols, but without them we cannot be sure of the similarity of the associative trains of ideas and images that go with the attitudes. As these are bound up with the brain, the direct communication of them becomes more difficult. Music succeeds in producing common emotions and attitudes, but the intellectual associations vary greatly with different listeners. It is the former that furnish the directly intuited character of intersubjective continuities. It is reported that Carlyle and Tennyson would often visit together for a long time without either saying a word. Then Carlyle would get up and take his hat and say: "That was a good visit, Alfred." Silent communion of soul with soul may give us the strongest sense of companionship.

We have seen that we must recognize two types of continuity, material and immaterial. These two types may occupy the same space, the immaterial intersecting, riding over and bridging the material in various ways. In a scientific way we have come to know one type of immaterial continuity with great definiteness, that of electricity. The other type of immaterial continuity, viz. the mental type of intersubjective communion, human beings have been acquainted with and convinced of since the beginning of social relations, but our knowledge of it is fragmentary. This is probably in part due to our scientific prejudice. In no case of spatial continuity can we follow it point for point. We must piece out our percepts by means of our concepts in any knowledge of continuity. But we make our concepts in any case to describe the intuited results. If we can understand these results only by assuming energetic continuity, *i.e.* if somehow two energies must contribute directly to the result, then we have a right to believe that the continuity exists.

In a physical compound such as H_2O we know that there must be action of the chemical energies upon each other, because the result is not the mere external addition of the properties of the two elements as we know them in other contexts. The compound, water, is a new individual with distinct properties of its own. The relations are in part at least internal relations, affecting the nature of each element contributing. What is true in the physical compound is true in the social compound. The will of the group, swayed by a common motive and common emotion, is not an external addition of the traits of the particular individuals, as taken either in psychological isolation or in other social compounds. The specific group mind has properties of its own which involve fusion of the various individuals into a new result. The various individuals feel a different degree of convincingness, of power, of suggestibility as regards the dominant impulse for being a part of the social situation. A new energetic field has been established, a new individual has arisen with distinct characteristics. There is somehow a real overlapping — an immediate inhibition or reënforcement of wills, peculiar to the unique social situation. The relation here as in chemical compounds affects the natures of the terms and is not merely an external relation between abstract entities. If we must thus take the result, then the continuity must be a real continuity. Will must somehow act upon will within a common energetic field to produce this individual unity.

It is, moreover, through the variety of such situations or compounds that the self comes to know its own characteristics. No man liveth unto himself; we live only in situations. And the most important situations for knowing ourselves are these common reactions, when we feel each other's tension, conflict, and sympathy. The ego, therefore, when conceived apart from such social situations is largely an abstraction. We exist in clusters or common fields of energy whose mutual attraction or repulsion we feel, rather than as abstract individuals. The particular self is a later abstraction made possible largely because of the variety and complexity of social situations into which civilized man enters as compared with tribal man. This, with his abstract name, enables himself and others to dissociate him from particular contexts and to regard him as an independent personality. But even this abstraction is a social function and is rather a discrimination of certain constant traits within a variety of situations than an independent existence which would mean nothing.

Not only is the social field of mind intuited as having its own unique traits as an individual, but it must be so dealt with in our practical relations. It commands our loyalty or antagonism as an individual. This is very different from the loyalty or the antagonism which we show toward particular components. It may even be the direct opposite. We may love the particular person and yet hate his nation or *vice versa.* This loyalty or antagonism to the group is not an attitude to a mere collection of particular persons, but a solidarity or unity that includes them and in a measure makes them what they are. In savage life where persons are not abstracted from the group, no difference is made in the treatment of the isolated person and the group. The religious command to the ancient Hebrews was to exterminate indiscriminately the members of another nation. The members were not conceived as having potential relations as possible members of the conquering group. The more common custom, however, among primitive nations was to preserve the conquered as slaves of the conquerors. This, however, was a merely instrumental and external relation. In the case of the subordinate unity, the family, the individual member was not, any more than in the nation, conceived as a potential member of other families. Even after marriage he remained a part of the family of the patriarch and subordinate to it. It is in the complexity of the potential relationships of civilized life that the individual comes to stand out as having a dignity and independence apart from any one complex.

In studying the nature of the social mind, we must proceed empirically as we do in the case of the particular mind. In the case of the social mind as in the case of the particular mind, we can study the subject-object relation, the unity, the identity, the worth, and the immortality of the individual concerned. As regards the subject-object relation, there is in the case of the social mind, the dominant, selective will, and there is the object aimed at. While there is a many-headed focus of the social consciousness, the real subject which evaluates and decides is not the particular individual, but the field of common tendency and emotion. It is the group will which decides through the particular person. This will selects differently — emphasizes different values, has different inhibitions, and releases, from the individual will. It may select to sacrifice, when the individual would conserve; it may even disregard the individual's claims altogether. The individual can say: I live, yet not I but the common will which liveth in me.

The leader is no exception to this. He is the function of the group, swayed by its common interest and in turn swaying it by his affirmation. The leader and the led are part of the same social situation — victims of the same illusions, subject to the same exaggerations, fascinated by the same ideals. Only because the leader and the led are controlled by the same values can the relation exist. There could have been no Napoleonic age of sacrifice and devastation if the people had not shared with their leader the false dreams of military glory and of bloody conquest. They were alike victims of the illusions of the age. The leader may grasp the situation more clearly than the rest; he may divine what the others want; but in the end he only leads because he symbolizes the ambition and ideals of the led.

In this social situation, the intellect plays its due rôle as it does in individual life. The object aimed at calls up the appropriate associations or means for its realization; and the movements and ideas spread from one to another by imitation — all in obedience to the internal contagion and the dominance of a common impulse. Here, as in the economy of the individual consciousness, the intellectual factor rises or sinks in prominence with the complexity and novelty of the task to be performed. In the chance crowd and the mob, habit and spontaneous association are sufficient to satisfy the simple impulse. In difficult situations deliberative judgment may be called for to adapt means to ends. But in either case it is the group will which is the subject controlling the train of ideas, the operations of the various brains involved. It is a common mind tapping the resources of the individual centers involved.

In the group mind, too, there is the consciousness of identity from moment to moment — the persistence of the impulse or ideal to be realized. This, as in the case of the mob, may be a mere momentary impulse, due to the predominance of a certain primitive instinct for the time being, such as fear or anger. But it may also be a more complex and permanent tendency involving ideal organization. The will of a nation may persist generation after generation while individuals come and go. Through the internal changes and external vicissitudes of ages, there is still something distinct and characteristic about British mind as contrasted with French. It is a mistake to identify the social mind with the mob merely and its evanescent existence. Its identity must be judged, as we judge individual identity, by the common drift of tendencies, by the persistent traits, which overlap the various moments of its existence. This is never abstract identity, any more than it is in the case of the particular self, but the persistence of a direction of will within an ever-changing historic process.

As regards the type of unity which dominates social minds here again we find the same variety as in particular minds. The unity may be largely external — the imitation and veneration of common customs and traditions — or it may be a thoroughgoing unity of common ethical ideals and the recognition of common claims and responsibilities. Only in the highest stages of development is the latter type of unity dominant. With the group mind, as with the particular mind, it is only through some great crisis that it discovers what it really means, that its dominant tendency rises to a conscious purpose, and that conscious loyalty to such an ideal becomes a guiding emotion in its conduct. In the absence of such crises, the ideal is implicit and life becomes routine, guided largely by the external associations of custom.

As regards the worth of social minds, this, as in the case of particular minds, must be determined by the dominant ideal. Does its leading furnish the largest harmony and realization of the particular factors involved? Does it produce proper control of the primitive by the ideal and yet give the primitive its due? Does it play the whole scale of values possible to human nature? Does it furnish the fullest possibility of development for the future? Then it has realized the maximum of worth. If, on the other hand, the common direction of tendency is produced merely by the intersection of a certain level of human nature to the inhibition and neglect of others, more particularly if this level be that of the primitive tendencies of impulsive satisfaction, then the social mind, as the particular, becomes immoral.

Finally, as regards the immortality of social minds,[1] they will survive as individuals will survive, if they have intrinsic worth as recognized by the growing process of history. Here as a matter of fact the immortality of the individual and that of his group are inseparable. The immortality of the Greek mind will survive while the minds of Homer and Plato survive. In them lives the genius of the Greeks, even as they live in its atmosphere and give articulate meaning to its tendencies. The merest fragment of a Greek artist is alive with the Greek mind. Neither individual nor social will depends upon physiological vehicles, once it has created for itself a spiritual body of art, science, and institutions. In these lives the real will, the real purpose of a people. Connect with this spiritual field of energy, and you feel the influx of its blood with new capacities for growth and appreciation. Whenever history has connected vitally with the Greek mind or Hebrew mind, it has meant a new epoch of life and inspiration — a new impulse towards science and art or a new heightening of the moral level of the times. And minds which can thus energize and transform mankind are not dead, though for a time they may be disconnected from history. In the unified self of human development they continue their full significance and life. And if there is an overarching spiritual communion, greater than humanity, enveloping and conserving spiritual values, these social minds, we may believe, have a unique individual immortality within it proportionate to their permanent significance.

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[1] For a fuller discussion, see the author's article, "Social Immortality," *International Journal of Ethics*, 1915.

PART III

SPACE AND REALITY

CHAPTER XII

Psychological and Geometric Space

There are two aspects to the space concept. These have not been sufficiently differentiated in the past, viz. the series character of the concept on the one hand, and the void on the other. The confusion of these two aspects of the space concept led to the classic controversy between Newton and Leibniz. Newton emphasized the reality of pure space. Leibniz emphasized the geometric or relational aspect. According to the former, "space has an existence, in some sense whatever it may be, independent of the bodies which it contains. The bodies occupy space, and it is not intrinsically unmeaning to say that this definite body occupies this definite part of space, and not *that* part of space, without reference to other bodies occupying space. According to the relational theory of space, of which the chief exponent was Leibniz, space is nothing but a certain assemblage of the relations between the various particular bodies in space. The idea of space with no bodies in it is absurd."[1] In the history of thought, the aspect of the void was the first to be developed. The interest in things preceded the interest in thought. Moreover, this aspect is involved in our practical adjustments. It is implied in the concepts of motion and interaction. It is presupposed in the answer of the atomists to Parmenides and Melissos. Parmenides argued that non-being is unthinkable, therefore, there can be no void and no motion. The atomists argued, on the other hand, that there is motion, therefore the void must be real; and hence assumed atoms and the void as their two ultimate principles. In Empedocles and his followers, the theory of pores as conditioning the interaction of things, both upon each other and upon our sense organs, might have opened up the problem of the relativity of knowledge, had the implications been seen.

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[1] Article, "Geometry (VII)," by Whitehead in the 11th ed., Encyclopædia Britannica.

The other aspect of the space concept, that of series, could come into prominence only as the Copernican change took place from the interest in things to the interest in those mental processes and laws that condition their appearance for us. In so far as the serial idea is present in ancient times, as among the Pythagoreans, it is ontological; and against this conception of space and time, Zeno had no difficulty in showing that continuity and motion are impossible. What he failed to see is that our points and fractional divisions are but ideal tools in the service of our will in predicting and controlling the energetic pulses of the world with which we must deal. These are not infinitely divisible, but only pragmatically so. With Aristotle, the concept of a figured space is upheld as against the void, but the boundary of one body with reference to another is still an ontological boundary. Since Kant, it has been generally agreed that the space concept is adequately expressed in serial terms; and hence the ideality of space logically follows. That the ghost of the void, so long laid, should rise again must make the hair of the boldest Kantian fairly stand on end. But the thesis I wish to maintain in this paper is the ideality, indeed, of serial space, but the reality of space as pure space, or the space of physics and astronomy. In this chapter, I wish to make some comments about psychological and geometric space. In the next, I shall proceed to the proofs for ontological space.

Psychological Space

First, a word as regards the presuppositions of our perceptual space, or the *a priori* character of the space intuition. It was this particularly that attracted the attention of Kant; and this priority to experience furnishes his most important proof for the ideality of space. Kant's arguments for the *a priori* character of the space intuition are, briefly: first, that in order to represent things outside myself, or "as side by side, that is, not only as different, but in different places, the representation (Vorstellung) of space must already be there";

secondly, that "it is impossible to imagine that there should be no space, though one might very well imagine that there might be space without objects to fill it"; thirdly, that "on this necessity of an *a priori* representation of space rests the apodictic certainty of all geometrical principles, and the possibility of their construction *a priori*." [1] Space, in other words, cannot be a generalization from empirical data; for in that case we could make only empirical judgments about it. That we can make necessary judgments about straight lines, the properties of triangles, the unity and infinity of space is due to its *a priori* character.

Now, as regards the first of these arguments, it is, of course, true that externality is an immediate fact. We do not start with experience as internal, and then project it into an external world, whether of things or selves. The "intuition" of externality is, first of all, an organic affair, due to the evolutionary adaptation of the organism to its world. It is not dependent on consciousness. The purely reflex centers react to specific external stimuli; and so, for that matter, do inorganic structures. The magnetic needle takes account of the presence of the loadstone as an external fact, varying with distance. These are primal reactions which antedate and condition conscious experience. They are subjective only to a false metaphysics. As regards the second argument, physical things must, of course, be conceived as in space; we cannot, in our physical experiments, either conceptually or actually get rid of space; but we can abstract from things by creating a vacuum and observe what happens. This does not hold in the world of our logical abstractions. Logical entities and relations do not have to occupy space; and in our logical manipulations we can, of course, abstract from space, and take the properties of things out of spatial relations. But this is no argument against Kant, for he expressly limited the relevance of space to the world of sense perception. In his third argument, Kant changes his point of departure from physics to geometry. The space which physics deals with does have empirical properties which cannot be predicated *a priori*, though our nervous system has long been adjusted to them in the survival struggle of the race, and so they are to a certain extent presupposed in our perceptions and reactions. They do not, however, have apodictic certainty. The properties of geometric space *do*, because while they are abstractions from our empirical world, they are determined by the system of postulates which we choose for the special type of geometry. Certainly the axioms of Euclidean geometry are not innate in the sense that the baby possesses them. They are rather logical limits and presuppose reflective thought with its laws, unless we regard everything as innate that we have learned before we are twelve years old, to use a jibe of Schopenhauer's. They had, indeed, become so ingrained in the social tradition of thought at Kant's time that he could not conceive the contrary. For us, however, they are only one type, though a convenient type, of geometric postulates. They certainly are not forms of naïve perception.

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[1] The quotations are from "The Critique of Pure Reason," section *A* of the Transcendental Æsthetic, Max Müller's translation.

It is true, however, that certain presuppositions are implied, from the point of view of our later reflective consciousness, in our biological and perceptual adjustments. The most general of these are the law of externality and the law of fusion. One is as important as the other for the building up of our world of sense perceptions. We must be so constituted as to locate some impressions within each other's space, and others in different spaces, in accordance with the economy of attention and the demands of conduct. The former is as important as the latter. We must have unity of things as well as externality of things. If we did not have the innate law of externality, we should not spread things out. If we did not possess the innate law of fusion, we should have no things to spread out. If interpenetration were not a law of our perceptual world as well as externality; if, on the contrary, it were the law of space that all impressions must be spread out as external to each other, we should not be able to learn from experience; we could never know a physical world. It is as a result of the demands of the environment that the organism has been forced to locate certain impressions, which it can attend to at the same time conveniently and which recur together, in each other's space — the prospective taste value of food in the space of certain tactual, olfactory and visual sensations. It has been forced also to orient itself with reference to stimuli, external to each other — favorable or noxious — as spread out in different directions and at different distances in its environment.

And now a word about the content of psychological space. Since Lotze, a great deal has been made of local signs; and the psychologist's imagination has shown no end of ingenuity in constructing space maps. In textbooks of psychology, a great deal of space has been devoted to how a space might have grown up. However ingenious these attempts may be, and however important pedagogically in robbing psychology of its "soft" character, it is becoming clear that these constructions are largely artificial — due to a certain psychological tradition, rather than an account of the actual genesis of our space coördinations. I, for one, cannot discover in normal activity any such map, either tactual or visual. I can, to be sure, by a voluntary effort, construct in imagination such a picture or map of my body and then localize with reference to it; and I can see how the compulsory construction of such a map, in order to understand the so-called psychology of space, especially with sufficient faith in authority, might make such a map a permanent part of our mental furniture. But as an account of genesis, it is gross mythology, which lacks even picturesqueness.

The ingenious explanation, by some psychologists, that the absence of any such psychological furniture in our actual consciousness is due to the law of economy, is of course equally *a priori*. It certainly must still be shown that anybody normally develops such a map, whether tactual or visual. At any rate, when we are in a position to introspect, it does not exist. I cannot discover even a word image except as it is artificially produced or called forth as a result of expectancy. When I catch myself in the act, I do not find anything of the kind. If you say that I have had this content, but that it has disappeared, that, at least, ought to be proved. The recollection from a previous existence, and almost any other psychological theory of genesis might be proved in the same way.

Our theories of space must be rewritten largely in biological terms. The coördinations of the reactions of the human infant, as in the animal, are primarily a physiological matter, with the difference that while in the chicken, for example, the coördinations develop largely in response to intra-organic stimuli before birth, in a human being extra-organic stimuli play a much greater rôle. But the coördinations, in either case, such as defensive movements, grasping, sucking, the coördinations of the various sense-organs with each other, walking, etc., are primarily organic adaptations. How far trial and habit enter in to make definite such organic adjustments must be ascertained by scientific observation. "In the human infant, walking seems, from such observations as have been collected, to occur at the proper age without training or unsuccessful efforts." [1] The cerebellum is the great coördinating center of muscular movements. It is "fundamentally an expansion of the local center of the vestibular branch of the eighth nerve." [2] Whether the semicircular canals furnish any sensations or not, their prime function is evidently to furnish stimuli to the cerebellum which has both a tonic function, and the function of being an organ of equilibrium. "The cerebellum is an organ where are gathered together sensory impulses from all the muscles of the body. In this way, the cerebellum receives information, as it were, regarding the condition of every muscle; in it is formed a sort of representation or reproduction — though so far as known, not attended with consciousness — of the dynamic condition of the entire musculature. To this is added the very important function provided for by the receptors of the inner ear, which responds to the positions and movements of the head in space. Thus the postures, movements, muscular tensions, and external strains exerted on the body at every movement, act on the cerebellum, and through it reflexly on the muscles." [3] In regard to the differential quality in our response to position, "the most that can be said is that perception of position is due to some peculiar quality or motor connection that each point on the skin or retina possesses." [4] But this quality, so far as the skin is concerned, is not apparent to introspection, and as regards the retina, would appear to be largely speculative. If such a differential cannot be discriminated by the expert psychologist, how can we expect the untrained man, who is not even looking for it, to judge on the basis of it? Evidently, the nervous system, whether it is the cerebellum or cerebrum, or some other center that is concerned, has a discrimination far keener than our consciousness. It seems clear that we must assume organic perception and organic memory to account for such adjustments. So far as correlating these differentials into definite directions and distances, all that we know about it is that it is due to movement. Through a trial and habit process, in which consciousness may not be present, and when present may be merely a spectator, or at most a cue for certain reactions, the parts of the organism become more definitely adjusted to each other, and to the external perspectives. One thing is certain, when we are in a position to introspect, the principal coördinations to our space world are a motor affair.[1]

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[1] "Elements of Physiological Psychology," Ladd and Woodworth, p. 157.

[2] *Ibid.*, p. 156.

[3] *Ibid.*, p. 156.

[4] Pillsbury's "Essentials of Psychology," pp. 163–164.

A striking argument against the intellectualistic theories of space perception has been furnished recently through some researches by Francis B. Sumner.[2] It was found that the flatfish, without any possibility of comparison, copies on its back the hue and (within certain limits) the geometric pattern of the bottom upon which it is placed. This is done through the flatfish's eyes. It is a trial and error process where practice greatly shortens the process. It is a selective adaptation which takes account of only part of the visual field; and since the comparison of patterns is by the spectator, and not by the flatfish, it does not seem necessary to assume consciousness. While one must be careful about carrying the analogy wholesale into human space perception, we may well suppose that the fundamental space categories are the result of the direct action of the environment without consciousness being necessarily involved. Our intuition of three dimensional space is doubtless due to the stimuli to which the organism must respond. The innateness of the straight line may, in the first instance, be due to the fact that light travels in straight lines, though survival advantage would tend to fix it. There is no reason to suppose that the human organism differs essentially in such reactions from the plant, for example, which reacts by definite tropisms. Should the plant become reflective, it would doubtless find the fundamental categories of space orientation as a part of its constitution.

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[1] Delabarre has shown the importance of eye movements in our taking account of direction. But it is not clear that either the stimuli or the taking account are conscious processes.

[2] *Journal of Experimental Zoölogy*, 10, No. 4. For an excellent summary see W. B. Pitkin in "The New Realism," pp. 397 ff.

It is hardly necessary to point out that our space consciousness, as we find it in adult introspection, is a highly conventionalized affair, and shot through with conceptual elements. In the process of social interpretation and adjustment, we come to abstract from our individual perspectives of nearer and farther. The various perceptual contents are spread out into a common scheme. The two heterogeneous types of "signs," furnished by sight and touch, are translated into common reactions in the service of our practical interests. *Loci* are divested of their purely egoistic reference. Different astronomers in different parts of the world can direct their telescopes to the same point in the heavens, and different geographers can coöperate in piecing out the map of the earth.

But such a perspective scheme, we must remember, is an artificial equivalent and not, as such at any rate, real. The map of England, with its dots and colors, the astronomer's squares and circles, the physicist's measures of footrules and yardsticks, are convenient substitutes for the actual relations and distances; but no one would maintain that they are the real thing. Even though perceptual symbols are used, as in the case of the map, the particular scale has nothing to do with the truthfulness of the map. It may be any scale, so long as it corresponds to the actual relations. With such a space construction, we have no quarrel so long as its phenomenal character is recognized. We do find it convenient for social purposes to construct such a system of artificial shorthand for the real interactions of things. What we must insist is that such a conception *means* something more than the phenomenal equivalents with which it deals; that it serves to symbolize real externality or distance which the will must acknowledge, and for the sake of which it invents its system of artificial equivalents. Such a space conception, then, just because it is convenient, must point to some characteristic of the real world which furnishes the necessity for such spreading out, how artificial soever the ideal equivalents may be.

Geometric Space

It is in connection with mathematics, particularly geometry, that the nature of systems has been most clearly worked out. Whitehead, in his "Introduction to Mathematics," speaks of three concepts as fundamental in mathematics — variables, form, and generality. By generality is meant that entities and relations can be taken over and over again in the variety of successive and simultaneous contexts. This characteristic we have spoken of before as recurrence, which is the name Poincaré prefers. It does justice to the empirical fact that experience is a moving quantity, at the same time that it has a certain simultaneous complexity.

If we turn now to the aspect of elements or variables in geometrical constructions, we find that these present a wide range of choice to the geometrician. Since the organizing relation of geometrical order is that of before and after, which implies the relation of between, we can see that any entities which will satisfy this relation consistently with our postulates will serve the purpose. Such entities may be points, lines, solids, or numbers in accordance with our convenience. The real numbers furnish a mathematical continuum which satisfies all the demands of geometrical systems. In any case, our units are conventional so far as geometry is concerned. It is true, indeed, that they are derived from experience and the geometrician may, for the time being, turn psychologist. He may show, as Poincaré has shown, that mathematical research, like all research, starts with intuition, even though it does not use intuition as a criterion of its validity. Our sense space, whether of sight or of active touch, does furnish us a manifold which can be spread out in various dimensions in accordance with the direction of differences implied. In the case of our sight space, we may arrange the variations of the pure color hues from red to yellow, yellow to green, green to blue, and blue to red along four axes so as to form a square. We may again arrange our grays in a linear dimension from the darkest black to the lightest white. We may also vary our color hues as regards saturation by moving them along the linear axis, which symbolizes the variations of brightness. Thus our artificial scheme for symbolizing the variations of light sensations gives a six-dimensional manifold; but it is not geometry. The color qualities are not mere functions of position in a series. They are physical facts with a character and extension varying with physical (including physiological) conditions. The construction of series is an after-thought. It is the qualities which determine the series and not the series the qualities. While there is psychological continuity in the graduated series of color qualities based on indistinguishables, this is very different from the concept of mathematical continuity. A finite manifold, consisting of a definite number of qualitative positions, could not furnish a basis for geometrical continuity. Moreover, physical colors vary with displacement, changing their quality with the direction of movement, while geometry demands that displacement shall make no difference to the entities involved, that is, it assumes free mobility. Nor will the situation be improved if we take the actual perspectives of the senses. In both our sight and our touch space, we must conceive certain qualitative differences, due to locality in the field, while geometry assumes a homogeneous space. But while the constitution of our sense manifolds does not make it possible to use them as bases for geometry, it is still true that they are the background of intuition which gives meaning to our abstractions; and the practical value, at any rate, of these abstractions is to furnish models which we can use in our concrete sense world.

How dependent geometry is for its starting point upon the world of intuition can easily be shown by an examination of the three general axioms which underlie all geometry. These may be stated, for our purpose, as diversity of position or externality, free mobility, and dimensionality. In each case, it is the background of intuition which gives meaning to our abstractions. Our geometrical positions are, in the first instance, abstractions from our sensations of movement, on the one hand, and from the substantive qualities which mark the termini of these movements in concrete perception, on the other hand. We can abstract from the specific qualities, and we have then the pure positions which have nothing as such to differentiate them, but must be defined entirely with reference to their external relations. Free mobility is derived in the first place from the intuition of the unimpeded movements of our limbs, however much we must abstract from this consciousness to get our pure geometric limit. Dimensionality is first of all a matter of the necessity of our biological reactions — ingrained into our nervous system by survival selection, and symbolized by the three spirit levels of the semicircular canals, as well as other compensatory organic adjustments. It is clear that our bodily movements are a basic factor in the genesis of our notion of space. This has been well stated by Poincaré: "For a being completely immovable there will be neither space nor geometry: in vain would exterior objects be displaced about him, the variations which these displacements would make in his impressions would not be attributed by this being to changes of position, but to simple changes of state; this being would have no means of distinguishing these two sorts of changes, and this distinction, fundamental for us, would have no meaning for him."[1]

Geometry, today, prefers the analytic method, in deriving its elements, to the synthetic method used by Euclid. The synthetic method starts with the point as the unit. Two points uniquely determine a line, three points determine a surface, and four points, a solid. This procedure is plainly circular. Points must in turn, be defined as determined by lines, lines as determined by surfaces, and surfaces by solids. At each step, therefore, we presuppose the very entity which we are to define. We cannot possibly derive our more complex units from the simpler ones. Cayley proposed to remedy this difficulty by introducing the concept of motion. By moving a point, we get a line, by moving a line, we get a plane, by moving a plane, we get a solid. This amounts, however, to our falling back upon our concrete intuition of the empirical solid. Having abstracted from its empirical character and conceiving it as a rigid solid, we can derive from this the concept of surfaces as its abstract boundaries, we can conceive lines as the abstract boundaries of surfaces, and points as the abstract boundaries of lines. But in any case, our geometrical entities are conceptual limits, and for geometrical purposes may be taken as conventions, just as other sciences take a certain starting point for granted. The derivation of the elements is primarily a psychological question. This is equally true of the socalled *a priori* character of our fundamental geometric categories. We may have reason to believe that such geometric concepts as externality and the straight line have an organic basis, and are in this sense presuppositions of our perceptual adjustments, but this is a matter for psychology to determine. For geometry, they are conventions to be defined in its own way, and for its own purposes.

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[1] "The Value of Science," p. 48.

It may be well to point out that the socalled non-Euclidean geometries are as dependent upon our concrete intuition for their content as are Euclidean geometries. Poincaré has shown that the so-called Euclidean spaces can always be translated into terms of Euclidean geometry. This preëstablished harmony is due simply to the fact that the various geometrical systems, in so far as they stand for real content, are all abstractions from our perceptual space experience. As a matter of fact, experience gives us all sorts of curvature. The non-Euclidean geometries, based upon positive or negative curvature, have their rise as truly in experience as the Euclidean elements, and would even seem to have the perceptual advantage since such elements as straight lines are not verifiable in the world of perception. Which type of geometry we shall use for practical purposes is of course a question of convenience for purposes of instrumental description. And here, the Euclidean seems to possess the advantage. So far as the variation of dimensions is concerned, we can find the basis for four or more dimensions in our actual experience even though our physical space seems determinable by three systems of coördinates. Poincaré shows that, if, with the variations in space, we always had variations in temperature, the latter would furnish the basis for another system of coördinates. The number system, with its complexity of qualitative variations, gives us the basis for an indefinite number of dimensions. So long as we emphasize merely the order character of our space concepts, the number of dimensions should furnish no particular difficulty; and the number *three* is no longer particularly sacred. Geometric space is anything that thought and imagination choose to constitute it. On its amorphous background, we can construct our systems at will in accordance with our postulates.

As regards its method, geometric space is simply a matter of logic. If we choose to make certain assumptions, a logical system can be built upon these. It may be of one, two, three, or of n dimensions; it may be qualitative or quantitative; it may presuppose any kind of curvature or the absence of it; it involves as many axioms as we choose to have; these may be less, or they may be more than those of Euclid, though as a matter of nomenclature, the question may be raised as to how far the term geometry should be applied to such constructions. It is simply a display of poetic imagination within the self-imposed rules of logic. It is no more the concern of the philosopher than any other product of poetic inventiveness, "Alice in Wonderland," for example. But, however much geometry may outstrip our humble sense world in its abstract procedure, and however imposing may be the logic of its method, it must always keep humble by remembering that it derives its content from experience; and that however unlimited may be its field, once it has set sail on the sea of pure abstraction, it only touches reality again when it returns to the necessities of concrete activity. And apart from its play value as a logical game, it must also prove an instrument in the realization of our purposes in the actual world. Within their own abstract domain, the mathematical ideals are posited as limits by our constructive will, and have no reality except as we thus posit them.

The critical modern study of geometry, however, if it has thrown no new light on the nature of things, has thrown a great deal of light on the nature of thought. On the critical side it has had an immense value as a solvent in destroying not only mathematical dogmatism, which was the longest to hold out against the critical spirit, but dogmatism as regards other "eternal verities" as well, which pointed to the axioms of geometry as their type and their warrant alike. The old bulwark of *a priorism* has at last been shattered. On its constructive side, its chief contribution has been the clearer consciousness of the nature of systems.

If we examine a little more closely into the form of geometric systems, we find that the postulates which we assume must satisfy the following criteria of logical definition: in the first place, they must be independent, *i.e.* they must not overlap each other, and they must be capable of being taken as simple for the purpose in question. In the second place, they must be consistent with each other. We cannot conceive a contradictory world. In the third place, they must be sufficient. They must be capable of uniquely determining the system which we have set ourselves to construct.

If we try to determine now what geometric postulates will satisfy these criteria, we must be guided here by the specific purpose that thought sets itself. In other words, it depends on what sort of geometry we want. There are some axioms, however, that seem to be implied in all geometric constructions. These, we have seen, are the axioms of discrete or external positions; of free mobility or displacement without change of state, *i.e.* with no other difference than change in position; and dimensionality or the possibility of ordering our material into different series. Besides these general characteristics, each system of geometry adds its own unique characteristics. Thus metric geometry implies the straight line. Euclidean geometry adds certain empirical axioms which are borrowed from the physical space, in which we make our predictions and physical experiments. Euclid's definition of the straight line as the shortest distance between two points, his axiom of parallels, his axiom of three dimensions, his definition that two straight lines cannot inclose a space — these must be treated as empirical laws in the sense that, while they seem to hold within our physical space, they are not essential to metric geometry in general. There seems to be no reason, however, why they should not be treated as conventions, and be used as a legitimate basis for geometric construction.

It must be clear now that the only necessity which geometry knows is the necessity of logic. If we choose to work out a certain type of system, we are bound accordingly by logical rules to see to it that our postulates fulfill the proper logical criteria within the constitution which we have selected.

So far as geometry is concerned, the temporal order presents no unique problem. If we spatialize it, as has commonly been done, into a line, then whatever holds for linear space, whether taken qualitatively or quantitatively, would hold for the spatialized temporal series. So long as we conceive the temporal order as an abstraction within which the present is merely a point which is posited by our thought, and from which we can proceed indifferently either backward or forward, as within geometric space, there is no reason why we should not geometrize our temporal order. It is not necessary to point out that this conception is entirely inadequate to the actual temporal world where movement implies more than mere change of position in a series, and where empirical novelties and constancies become the object of interest. But geometry is no more concerned with the real temporal world than with the real spatial world. Its game is a game of logic. It is true that the physical scientist can select among mathematical models such as will enable him to manipulate or anticipate his facts. Mathematics does furnish a convenient framework for empirical science. But this is not the concern of pure mathematics, and is often best accomplished when most remote from the intent of the mathematician. It goes to show that our world is on the whole a logical world, or at any rate, a world where the ideals of logic are relevant.

We may agree with Keyser that, in whatever sense Euclidean geometry can be said to exist, in the same sense can the other types of geometry, such as n-dimensional, be said to exist. But this amounts to saying that the reality of geometry is merely that of abstract logic, and that existence for geometry means merely the consistency of propositions with each other, and with the postulates of the special system. It has nothing to do with empirical existence. To quote from Whitehead: "All branches of pure mathematics deal merely with types of relations. Thus, the fundamental ideas of geometry (*e.g.* those of *points* and of *straight lines*) are not ideas of determinate entities, but of any entities for which the axioms are true. . . . They do not refer to a determinate subject. . . . The axioms are propositional functions. When a set of axioms is given, we can ask (1) whether they are consistent, (2) whether their existence theorem is proved, (3) whether they are independent."[1]

We may agree with Kant to the extent of regarding geometric space as ideal. Its form is the form of thought itself; and only in this sense does it predetermine our investigations. Looked upon as instrumental to our empirical world, mathematics serves beautifully to illustrate the three meanings of the term *ideal*. Ideal may mean an *a posteriori* and convenient fiction. This is illustrated in such conceptions as the trajectory of motion, and in Kepler's squares. The movement of the cannon ball does not really consist in the trajectory, though it is convenient for us to conceive such a line in space for its description. In the real movement there is the impulse which spends itself, and which, on the plate of our memory, or perhaps of the physical camera, leaves the record of a path in space. The movement itself is a unitary affair, and cannot be dealt with except for purely artificial purposes, as a series of static positions. Kepler's laws have been a convenient fiction for describing real planetary motions; and, latterly, we have come to look upon the law of gravitation as a convenient approximation. Again, the ideal may be an abstraction from the real context. The geometric constellations may be a real aspect of the dynamic relations. The straight line seems to be a reality in the world of physical motion. Light seems to move in straight lines; and so do all known entities, except in so far as they are influenced from their direction by other interfering energies. Geometric distances are real aspects of the physical world, for energies vary with the distance. Geometric shapes and numerical ratios must be taken account of in the empirical description of our world. Even linear direction must be taken as real, an aspect of an energy system, as is plainly seen, for example, in the case of inertia. Energies oppose less inertia to energies acting at the right angle to their direction than to those that act in an opposite direction. It is only as conceptual abstractions that such properties become conventional and inert. The conceptual ax does not cut real wood nor do our conceptual shapes, lines, and patterns effect physical changes. As aspects, however, of energy systems, they become both real and effective. Descartes was not wrong in emphasizing the reality of the geometric characteristics of things. His error lay in neglecting other characteristics such as inertia. Finally, the ideal may figure as a formal limit to the empirical world. Our empirical observations may only approximate to such limits; and yet we are bound by the constitution of our minds to postulate them; and they may indeed, as Plato pointed out, be more real than our halting empirical approximations. In all three cases of the term *ideal*, mathematics seems to play a part in our dealing with the facts of our experience, — sometimes as a purely instrumental fiction in the service of our description; sometimes as abstract though real relations within our world; sometimes as certain logical and æsthetic norms which we demand that the universe shall respect. In the broad sense that the universe is a coherent and logical world, we may say that the universe geometrizes, however faulty may prove our own provisional generalizations.

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[1] Article, "Geometry (VII)," Encyclopædia Britannica, 11th ed.

The most brilliant of modern idealists has striven to give geometric perspective space a real existence in his final conception of reality. In Fichte's "New Exposition of the Science of Knowledge," space becomes the "permanent, absolute contemplation," "which, however, presupposes itself as absolutely being to itself according to the demonstrated law of the reflection of consciousness. It is the on-itself-reposing, firm glance of intelligence, the resting immanent light, the eternal eye in-itself, and for-itself." And again: "The substantial, solid and resting space is, according to the above, the original light, before all actual knowledge, only thinkable and intelligible, but not visible, and not to be contemplated, as produced through freedom." The construction of space is secondary, "a taking hold of itself on the part of light, a self-penetration of light, ever from one point and realized within knowledge itself; a secondary condition of light, which, for the sake of distinguishing it, we should term clearness, the act enlightening." And truly it needs enlightening. What is significant for our purpose is that space becomes for Fichte the self-intuitive eternal system of truth, which for him amounts to reality. It is not merely the type of the eternal, but it is the eternal; not merely the valid, but the real. Perhaps Fichte is right, that if we are to translate space into terms of one eternal self-contemplation, such must be its meaning. But that loses whatever of meaning space has for us. It reduces it to a mere spaceless eternal perspective.

CHAPTER XIII

The Nature of Real Space

We have, in the previous chapter, examined into the presuppositions of space construction, and found that these must be expressed first of all in biological terms. We next took up the ontogenetic side of our space perception, and found that the content, in so far as it exists, is probably concomitant to the going on of the growth process, determined by the phylogenetic tendencies, and intra- and extra-organic stimuli. What actual content there is, moreover, must be determined by statistical inquiry, and not *a priori*. We then examined into geometrical construction, and found this to be a matter of logic, and to be conducted as any free logical inquiry. The ideals, however, of mathematics, as other ideals, seem to have a phylogenetic basis. Lastly, we examined into the conception of space, as perspective, by metaphysical idealism. When regarded as phenomenal, we had no reason to quarrel with this view. When, however, translated into terms of absolute idealism, as by Fichte, space loses its significance.

We must now turn to the other aspect of our concept, and try to discover what real space means, or what difference it makes in our accounting for the facts of experience. The series aspect of space, we have agreed, is ideal construction. Points exist only as we posit them as the ideal pegs on which we hang our qualitative world. To make up a real world of such ideal points, is absolute nonsense. But what remains after we abstract from this series character? Nothing at all, some would answer. Zeno is right that space is *no thing*. Neither are the positions in space things. They are our ideal abstractions for our convenience. But though space is no thing, we shall try to show that it is not a merely ideal nothing, but a real entity which conditions not only subjective construction, but real action as well.

Proofs of the Existence of Space

First of all, such a space zero is perfectly conceivable. The modern study of number has shown us that the conception of nothing does not equal no conception. The zero of the number series is of basic importance in the whole conception of number; and as the number series is not intelligible without it, the number zero possesses all the reality of the series which it limits. But we can conceive pure space, as we conceive the number zero, as a limit by abstracting from the contents of space or the things in space. Hence, space must be as real as the things in space. It is a matter of surprise that while the importance of the zero concept for number has received so much attention in recent times, the importance of the space zero, which both chronologically and ontologically is more fundamental, should have been ignored. But the reason for this can be found in the fact that, since Kant, thought has been more interested in its own machinery than in its objective conditions.

It is Parmenides who first builds a philosophy on the impossibility of conceiving empty space, and, consistently with that, outlaws motion. Failing to form a picture of pure space, he would forever taboo it as "unspeakable." We can have only filled space, the homogeneous, spherical plenum. "There is no more of it (being) in one place than in another, to hinder it from holding together, nor less of it, but everything is full of what is. Wherefore all holds together; for what is, is in contact with what is." Empirical proof, Parmenides would scorn; the mere inconceivability is enough. And so originated the thesis: nature abhors a vacuum, which certainly does not seem to be the case with the people's minds who have unquestioningly accepted this *a priori* statement in spite of the facts to the contrary.

I have pointed out elsewhere that *a priori* inconceivability as regards existence is a matter of custom. It was once inconceivable that men could sail outside the Pillars of Hercules; that there could be more than seven planets, etc. But in all those cases, *a priori* inconceivability has given way to facts. And so it must in regard to pure space. While we have invented media with all sorts of contradictory properties to save our customary conception of motion as mechanical impact, we have finally come to the realization that the facts are simpler than our theories, and that if we dispense with our hypothetical media, we shall have all the results without absurd assumptions. As Professor L. T. More says: "Direct evidence shows that kinetic energy is propagated through what experimentally must be regarded as empty space. This energy, called heat and light, passes to the earth from the sun, but is neither absorbed nor otherwise modified, until ponderable matter is encountered." [1] Pragmatically, space must be known through the difference it makes to the energies which traverse it. And this difference is a real difference, distinct from energetic reactions. We have passed from the stage of judging space *a priori*, to determining its existence and character by the actual difference it makes to behavior. It might be remarked, however, that if motion is *a priori* inconceivable without an absolute plenum, it is certainly *a priori* inconceivable in such a plenum — unless the plenum makes no difference, and then it is pragmatically indistinguishable from pure space, and scientifically superfluous. A relative plenum, the evidence indicates — space shot through with energies, where, however, we can both theoretically and physically abstract from the energies, and approximate pure space. One thing is certain, on no theory of the physical world can we get rid of the problem of energetic diversity, and of empirical distance as making a difference to interaction, whether it be in our conceptions of the constitution of the stellar constellations, or of the minute energetic constellations of electric charges within the atom. In any case energy does not abhor spatial distance, but implies it.

Once having shown the conceivability of pure space, we must prove its existence, as we prove the reality of any other entity, by showing its convenience for describing the facts of experience. The criterion of the reality of our concepts is everywhere the same: Does the concept work? Does it make experience simple, consistent, and intelligible? Must we act as if it were so? We must not start by assuming space to be a thing-in-itself, but judge it by its properties as required by practical experience. How blind the dogmatic method can make us is well illustrated by Russell: "Assuming that there is physical space, and that it does correspond to private space, what can we know about it? We can know *only* what is required, in order to secure the correspondence. That is to say, we can know nothing of what it is like in itself, but we can know the sort of arrangement of physical objects which results from their spatial relations."[1] But when we know this, don't we know the nature of space?

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[1] *Hibbert Journal*, Vol. VIII, p. 816.

Kant argues that we cannot prove the existence of empty space, because we can have no intuition of empty space: "We see, therefore, that experience can never supply a proof of empty space or empty time, because the total absence of reality in a sensuous intuition can itself never be perceived, neither can it be deduced from any phenomenon whatsoever, and from the difference of degree in its reality; nor ought it ever to be admitted in explanation of it. . . . As every reality has its degree which may diminish by infinite degrees down to the nothing or void, there must be infinitely differing degrees in which space and time are filled."[2] If space is not a thing, it must be clear that pure space could not be perceived, since perception is an energetic relation of stimulus and organism. Nor could we note degrees of its presence or absence, since it is not an energetic quantity. We can, however, verify it through experience indirectly, as we succeed in abstracting from the energies which ordinarily fill it. The vacuum of the receiver is noticed by the absence of sound. The infinite degrees which we must pass through to arrive at the absence of any energy are a matter of mathematical description, and do not prevent us from actually exhausting the real energies.

We must conceive of pure space as the precondition of filled space, as the limit of exhaustion, which, moreover, we can approximately attain. If by exhaustion, we could get the space zero without content or resistance, it must have been real all the while. It is not necessary to the reality of pure space that it should actually exist separately or empty. We cannot get the quality of blue separate from all other facts, yet we do not therefore deny its existence. If we can approximate pure space as a limit, it must be just as real as though it existed separately. The nearer we succeed in such abstraction, the better we can ascertain the properties of pure space. These properties we can even now predict as limits. It is convenient, therefore, to conceive of pure space, whether empty or filled. Only with reference to it can relative emptiness or relative resistance have meaning. To illustrate, let us assume that hydrogen gas is the only gas that passes through platinum. Suppose, then, that we have a vessel of platinum filled with pure hydrogen gas. Let this escape, and what is left?

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[1] Bertrand Russell, "The Problems of Philosophy," p. 49.

[2] "Critique of Pure Reason," Transcendental Analytic: Anticipations of Perception, p. 141, Max Müller's translation.

The usefulness of the concept of spatial intervals within the minute structure of the atom itself has recently been shown by Professor T. W. Richards. That the atom is not the absolute plenum which Democritus took it to be, but is a composite constellation, has been proved from radio-active phenomena. Professor Richards proves the same from the simple facts of the compressibility of solids. To quote his own statement: "The idea that atoms may be compressible receives striking confirmation from a recent investigation concerning the small effect of low temperatures on the compressibility of metals. The average compressibility of aluminum, iron, copper, silver, and platinum falls off only seven per cent, between the temperature of the room, and that of liquid air. Extrapolation of the curves indicates that at the absolute zero, very little further diminution should occur. So far as we can guess, therefore, the hard metals are almost as compressible at the absolute zero as at room temperatures. But at the absolute zero, all heat-vibration is supposed to stop; hence this remaining compressibility must needs be ascribed to the atoms themselves."[1]

The conception of zero space has proved convenient as a limit in conceiving Newton's first law of motion. While this law is an abstraction, it must be remembered that such abstraction is empirically possible to a certain extent. The abstraction, therefore, is not merely ideal. On the contrary, it is real conditions which we must deal with in treating of resistance and motion. I cannot see how a merely ideal limit could make any difference to actual movement. Mathematical points, lines, and surfaces, while legitimate abstractions, neither obstruct nor facilitate movement. They only exist in our ideal dimension. Even if we have not been able to get absolutely empty space, we can, as already shown, approximate to it and predict definitely what would happen if we could get it. The only problem is: Are we compelled to assume such an entity in order to account for the facts of experience? By postulating pure space, we find it easier at any rate to account for the forms of motion as they actually take place owing to the resistance and diversity of the physical world. The convenience of the conception must indicate that it has a foundation in the real, otherwise it could not be empirically approximated as well as hypothetically useful. It is the real limit which makes our conception relevant.

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[1] Address before London Chemical Society, 1911.

Even geometry in assuming free mobility as one of its few remaining axioms, shows that it means by space something more than series, for free mobility is the very precondition of space construction. If, after abstracting from things, space itself offered resistance, geometry would not be possible. Even in geometry, therefore, pure space is presupposed as objective to serial construction.

The conception of space distance cannot be explained as a property, either of things or of selves, and yet conditions the actions of things. By distance, I do not presuppose our geometrical concepts such as the straight line. A straight stick is more convenient than a crooked stick for social measurements, but in either case, we presuppose the externality, or side-by-sideness, of perceptual processes. A yard stick, while a convenient unit, does not create the distance it measures. This differs, moreover, from the ideal distance or stretch in our conception of series, for example. Distance transferred to mental processes and their externality is only a figure of speech. Space distance is the only real distance we can conceive. All other distance or stretch depends upon this. Number distance or tone distance is a qualitative conception, and merely means degree of difference, or intervals in an order series. It has nothing to do with space, except as for convenience we spread out our qualitative differences in space. Except for space distance, however, all perceptual things would have to coalesce or interpenetrate. Pure space, then, must be real, if distance must be conceived as real.

Without the conception of distance, both acceleration and the limitations of intersubjective communication become unintelligible. Wills, appreciative selves, while not extended, are limited by conditions which must be met and cannot simply be brushed aside as illusions. Here lies the difference between real distance, and the derivative conception of distance or stretch in series such as the number and tonal series. In the latter case, the distance or stretch is determined by the will, is comprised within its purpose. A long stretch or a short stretch will serve equally well to spread out its contents, so as to indicate the direction of difference; and as the termini are comprehended within the will's own positing, they put no condition upon the will as regards passing from one to the other. They are only ideally external within a unity of consciousness which claims them equally and *simul*. Not so with space distance. Here the distance which separates friends in America and Europe, and limits their intercourse is not the creature of their ideal positing simply; the ideal bridging of it does not remove the limitation to the will as in the case of two points in a series. If it is posited by them, it is because they are compelled to do so, and no enlightenment from Kantian idealists serves to sweep away the limitation. In short, what makes other egos and things objective to me, viz., their independence of my subjective purposes, makes also space as distance objectively real to me. As I must acknowledge other egos, so in order to realize my practical purposes, I must acknowledge space. Space is the condition of the externality of egos, and of things, too, whether they can be acknowledged as egos or not. It is not a subjective, but an inter-subjective condition, limiting the communication and coöperation of egos. Within the ego, space exists at most only figuratively, as when we speak of the space of our ideas.

We often speak, in this age of electricity, of annihilating distance. It is true that social sympathy and unity are possible in this age to an extent they never have been before. Humanity, by means of the telegraph and telephone, can live a common life to a marvelous degree. And yet it is loose language even so to speak of the annihilation of distance, for distance does make a decidedly measurable difference to our communication. While the conditions of social unities have altered vastly since the days of the proximity of tribal life, still it makes a difference to the kind of relations we can have with each other that we are separated by distance.

Nor can we regard space as subjective, and motion as objective, the halfway house of some philosophers. If we regard motion and change as objective, we have to regard space as objective. This is true of qualitative change as well as quantitative, as the former too would be impossible without some kind of pluralism and externality. Melissos saw deeper than he knew when he maintained that if there is rearrangement, there must be empty space, even though he supposed the conclusion to be absurd (taboo it really had become, and has been mostly since) and so returned to the solid block universe of Parmenides. This he conceived as unlimited to exclude empty space from the outside.

In explaining motion, we have found the conception of pure space useful in two ways. First, it makes it possible to abstract from bodies and resistance, and so to state Newton's first law of motion. Secondly, it gives us the possibility of objective distance, which cannot be reduced to the properties of things. Reactions of things, while they are determined by the properties of things, also vary with distance, which therefore, cannot be regarded as merely subjective. It is hard to see how mere subjective position could influence the intensity of motion. Motion in an ideal space should be consigned to the confused limbo of square circles, mermaids, and centaurs.

Our space conception must be such in the end as to satisfy our space intuition. While we must not invoke intuition as explanation, yet we must always start with intuition, and the conceptualizing process must be such as to clarify and terminate in intuition. Where our intuitions, moreover, as in our general reactions upon our environment, are due to survival selection, they have, as Spencer says, well-nigh the force of demonstration, and must not be lightly brushed aside. While the space intuition cannot be expected to separate sharply between the physical and spatial character of our world, yet the unspoiled space intuition always has insisted upon an ontological zero space as over against physical and subjective things. Hence, the natural part the void plays in early cosmogonic and physical theories. However much cruder the tools of Leucippus and Democritus than those of Kant, yet their conception of an ontological void gives us a more fundamental character of the space concept than the aspect of serial construction emphasized by the Kantians.

Most important of all is the fact that this conception of space satisfies the criterion made so much of by the epistemological idealists themselves, and more than once implied in the preceding, viz. that those conditions which limit, and must be taken account of in the realization of purpose, must themselves be real. Otherwise, they would not be conditions. Space and time must certainly be taken account of in realizing our human purposes; therefore, they must be as real as those purposes themselves. If they were merely illusion, or "mere appearance," then it ought to be possible to ignore them, at least after finding out the truth about them. Take space distance, for example. Our measurement of this with reference to geometrical ideals, such as the straight line, our use of a particular kind of measuring rod, such as the yardstick, must, indeed, be regarded as a matter of ideal selection and construction. But if I live on the Pacific coast, and an important philosophical session is held in New York, or if I want to see my friends across the sea, the mere declaring space ideal does not annihilate the limitation. Intermediary processes must somehow be reckoned with; and those processes presuppose space as the condition of their externality. Thus, space as distance conditions the equations of the astronomer and the joy and communion of willing selves. And so with time. No mere conversion to absolute idealism will make new wine old, will convert youth into old age, or make the faded flower bloom again. I do not see how in the only world of purposes of which we know anything, it is possible to ignore the space and time limitations of those purposes. We grant that the space and time characters taken apart are meager enough when contrasted with the concrete life of feeling and willing. We are, indeed, in our inmost beings willing and appreciative selves. But space and time remain, nevertheless, irreducible limits to which we must adjust ourselves, if we would be sane. Only by so adjusting ourselves can we realize our purposes.

I do not insist upon a greater reality for space than for egos or things, *i.e.* for energy, whatever form it may take. All I insist upon is that we must acknowledge both types of reality. The question whether space could exist before things could have meaning only for those who, with the medievals, regard the world of things as created at a finite time out of nothing — as embodying eternal archetypes or what not. It is the province of philosophy like science, however, to investigate the constitution of the world, not its creation. The temporal priority of space to things, can therefore, have no significance for us. We can, however, abstract distance from things, and must do so, both for purposes of physical science, and for practical life.

Properties of Space

If space is real, we cannot determine its properties *a priori*, but must ascertain them in the same empirical way as we ascertain the properties of things. We must distinguish here between the methods of geometry and the methods of empirical science. In the former case, we have seen that the properties are predetermined by the postulates of the specific system. In the case of real space, as in regard to the empirical world generally, the properties must be discovered inductively. "It is true that by natural selection, our mind has adapted itself to the conditions of the external world," as Poincaré says. It is thus predisposed to certain types of reactions which are advantageous in the world in which we find ourselves. But this predisposition, so far from proving space categories to be phenomenal, as Kant would have it, would tend to show their relevance. They have been forced upon the organism as a result of the demands of the environment. Science, however, cannot stop with intuition, but must supplement and correct intuition by experiment.

The question naturally arises how we can experiment upon space. Poincaré holds that we can only experiment upon bodies, and their relations: "Experiments only teach us the relations of bodies to one another; none of them bears, or can bear, on the relations of bodies with space, or on the mutual relations of different parts of space." And again: "Your experiments, however numerous they may be, bearing only on the relations of bodies to one another, will reveal to us nothing about the mutual parts of space."[1] This argument does not seem conclusive. While it is true that the experiments bear directly on bodies in space, it is also true that, indirectly at any rate, we can know the properties of space by the differences which they make to the reactions of bodies or other energies. If space had four dimensions instead of three, if it were discontinuous, if it offered interference to motion, etc., we would find it out in the reactions of things; and our account of reality would have to be different. The case of space is in no wise different from that of other entities of which we have no immediate evidence, but which we assume and endow with definite properties in order to account for the behavior of entities with which we can directly deal.

While we must distinguish between the properties of real space, and the properties which are postulated by the various types of geometry, in some respects we can expect to find agreement since the world of geometry is an abstraction from our concrete experience. We must be careful, however, that the agreement is not one of mere words rather than of fundamental intent. Thus, the property of externality is a fundamental condition, both of geometric space and real space. Externality, however, in geometric space may have to do only with qualitative diversity in an order series, though in metric geometry, it seems to imply something more. It here, at least, symbolizes distance. Externality in the case of real space, is such as the physicist and astronomer, as well as the practical man, must deal with in their calculations and practical adjustments. According to Newton's law of gravitation, the attraction of bodies upon each other varies with the masses and inversely as the square of the distance. In all formulæ for energy reactions, distance figures as an independent and unique variable. This is as true in our social interrelations of love and war as of light rays and stellar masses. This is quite different from externality in a series, such as the number or tone series. Externality, in the latter case, is merely figurative, and indicates the direction of differences.

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[1] "Science and Hypothesis," p. 60.

Geometric space, and real space are both, it would seem, characterized by dimensionality. But here, again, the meaning of the term may be vastly different. Dimension in geometry has reference to different directions of variations. The number of dimensions is determined by our postulates. When we speak of real space as having three dimensions, we mean that positions within it are determinable with reference to three straight lines at right angles to each other, or the Cartesian coördinates. Now the coördinates themselves are, of course, conventional. Real space, so far as we know, is divided by no straight lines at right angles to each other. These are supplied by our mind. Some other device might do for symbolizing the relations of bodies to each other in space. But the Cartesian coördinates are the most convenient. And they are the most convenient, because they enable us to adjust ourselves to the character of real space in the simplest way. While it is not correct, perhaps, therefore to say that space *has* three dimensions, space has such a constitution as is determinable by the three Euclidean dimensions. No less will suffice for our adjustments to the real world in space, and no more are necessary. If an additional dimension were necessary, we should soon find it out, as things would continually vanish out of our ken and mysteriously reappear in our world, contrary to all our laws of expectancy. When they seem to do so, it is hocus-pocus. The temporal order has sometimes been spoken of as a fourth dimension. It is, indeed, another dimension with its own determinations and order, but it is not a dimension of space.

Another characteristic which geometric space and real space seem to have in common is that of homogeneity. Space is neutral with reference to the quantitative and qualitative diversity of the world of energies. It has no positions or relations of its own. This implies, in the words of Simon Newcomb: (*a*) "It is the same for all bodies. Wherever one body could move, thither could any other body move." (*b*) "It has no qualities or differentia dependent either on position or direction."[1] In a more picturesque way, this has been expressed by Clerk Maxwell: "There are no landmarks in space. One portion of space is exactly like any other portion, so that we cannot tell where we are. We are, as it were, on an unruffled sea, without stars, compass, soundings, wind, or tide, and we cannot tell in what direction we are going. We have no log which we can cast out to take a dead reckoning by. We may compute our rate of motion with respect to the neighboring bodies, but we do not know how these bodies may be moving in space."[2] While homogeneity is a characteristic alike of geometric and real space, it is a mere abstract postulate for geometry, while it must be empirically ascertained for real space. Energies act as if real space were homogeneous. We can satisfactorily account for the behavior of things in space by taking account merely of their own positions and relations. These are not distorted in any manner by space. This makes possible free mobility so far as space is concerned.

Real space seems to be homoloidal, that is, two parallel straight lines may be produced indefinitely without converging or diverging. This property it shares with Euclidean geometry which is shaped upon the properties of real space. It is not a postulate of various types of non-Euclidean geometry. We may construct a geometry on the assumption of positive or negative curvature. But so far as experiments are able to ascertain, real space has zero curvature. Light rays travel in straight lines. To be sure, this, as other characteristics, must be taken as pragmatic. As Clifford has pointed out, a slight departure towards positive or negative curvature might escape our instruments of observation. If space and things alike had a certain inherent curvature, it would, of course, be impossible for us to discover. Our straight lines would in that case be a certain standard curve which practically would mean a straight line. We have not spoken of the supposition of projective geometry, that parallel lines meet at infinity, since this is a mere convention to make it possible to deal with all lines under a common formula.

Another pragmatic characteristic of space, is that of continuity. Space seems to be the one absolute static continuum. In a space made up of real discrete points, objects would have to vanish, and to be recreated again at every stage of their motion. While such miraculous occasionalism may not be inconceivable, since it has been conceived by philosophers, it is certainly a clumsy assumption, and violates the law of economy. Our experience seems to indicate that we have identity within the movement. Things do not disappear and reappear, but persist through their motion in space.

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[1] Article, "Space," Baldwin's *Dictionary of Philosophy and Psychology.*

[2] "Matter and Motion," Article CII.

We must be careful here not to confuse the mathematical conception of continuity, and the conception of a metaphysical continuum. The mathematical concept of continuity is an order concept. In the words of Fine: "The points of a right line constitute an ordinal assemblage of points, which is called continuous because it possesses the following attributes: (1) Between any two points of the line there are other points of the line (Aristotle and Kant). (2) If all the points of a line are distributed in accordance with any given law into two assemblages, A and B, so related that each point in A lies to the left of every point in B, either the assemblage A will possess a last point to the right, or the assemblage B a first point to the left (Cantor, Dedekind)."[1] Stated briefly, this means that a line is infinitely divisible, on the one hand, and that any cut of the line is common to the two divisions thus constituted. In the case of numbers, this means that the irrationals, such as the cube root of two, are required as well as the rationals, *i.e.*, it is the series of real numbers which is continuous. The question of ordinal continuity as thus defined is, however, a distinct question from that of the metaphysical continuum. To quote from Poincaré: "The continuum so conceived is only a collection of individuals ranged in a certain order, infinite in number, it is true, but *exterior* to one another. . . . Of the celebrated formula, 'the continuum is unity in multiplicity,' only the multiplicity remains, the unity has disappeared. The Analysts are none the less right in defining their continuum as they do. . . . But this is enough to apprise us that the veritable mathematical continuum is a very different thing from that of the physicists, and that of the metaphysicians."[1] The real continuum implies interpenetration of parts and not the mere side-by-sideness of a qualitative order. We derive our intuition of continuity first of all from our free movements with their unity of impulse, and we then extend our intuition to other moving continua. But all moving continua presuppose the pure continuum of space — interpenetration without difference, the pure amorphous background upon which all our physical and mathematical continua can be drawn. While the present mathematical definition of continuity seems to be satisfactory for the ordinal type of continuum, it cannot be said to define the unique type of continuum, which we find in the case of space.

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[1] "Continuity (in Geometry)," Baldwin's *Dictionary of Philosophy and Psychology*.

The granular conception seems on the whole to have been victorious in the physical world. The ether, indeed, has long been depended upon to fill the gaps and to furnish a genuine physical continuum. It was invented on the analogy of known media. As sound travels through the medium of air, so it was supposed that light must have a medium to travel through, and this medium is consequently conceived as having the velocity of light. The analogy is faulty, however, since sound is a complex energy, while light is a simple type of energy. Again, air waves are a genuine form of energy, which the ether supposedly is not. The fact is that on this reasoning, we would require an infinite regress. If each energy requires a medium to travel through, then this in turn must have a medium to travel through, and so on, indefinitely. If, moreover, the ether has the velocity of light, then some other form of energy of vastly higher velocity perhaps, would require a different medium. Lord Kelvin, for example conceives gravitation as having a velocity a million times faster than that of light. To say dogmatically that there can be no higher velocity than that of light, since that is the velocity of the ether, sounds rather medieval. Furthermore, the properties of ether, as pointed out by Karl Pearson, are far from clear and distinct. They seem to include, side by side, the properties of absolute fluidity and absolute incompressibility. "Treating the ether, not as a conception, but as a phenomenon, we find it difficult to realize how a *continuous* and *same* medium could offer any resistance to a sliding motion of its parts, for the continuity and sameness would involve, after any displacement, everything being the same as before displacement. . . . Finally, any relative motion of translation as distinct from one of rotation, seems excluded by the idea of absolute incompressibility. . . . When we project the ether into our phenomenal world, it is at once recognized as a conceptual limit unparalleled in perceptual experience, and we do not feel at home with it." [1] The ether, as ordinarily conceived, thus embodies two opposite limits, that of the absolutely rigid solid, on the one hand, and that of an absolutely fluid continuum on the other hand. The former limit is evidently derived from the physical world as we know it. The latter limit would seem to be identical pragmatically with pure space.

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[1] "Science and Hypothesis," p. 17.

If, again, we conceive the ether as granular, we must give up the property of an absolute continuum so far as it is concerned. This is not always clear to those who hold the view. Sir Oliver Lodge, in speaking of the ether, says: "As to its density, it must be far greater than that of any form of matter, millions of times denser than lead or platinum. Yet matter moves through it, without any friction or viscosity. There is nothing paradoxical in this: viscosity is not a function of density; the two are not necessarily connected." [2] It is, however, not a question of degree of density, but of the absence of discrete units, however packed these discrete units may be. If they act as separate impulses over any distance, we have no guarantee of an absolute continuum; this must be looked for outside of the constitution thus assumed.

Another property which is implied in regard to space is that of infinity. This property, again, must not be confused with the ordinal infinity of mathematics which does not occupy real space at all. The question of the infinite extent of real space is a pragmatic one. It is certainly true for our scientific purposes. However much the powers of our telescopes may be improved, we cannot discover any limit to space. Yet this fact can never amount to an absolute proof. Such a proof would have to be indirect, and based on logical considerations. It is true that we cannot conceive the contrary. While we can conceive a limit to the physical world in space, we cannot conceive coming to the end of the void. But, as we have pointed out before, our ability to conceive the contrary is largely a matter of custom with its habits of thought, and, in any case, cannot amount to absolute proof where the constitution of our empirical world is concerned. A more satisfactory approach would be from our knowledge of the constitution of the physical world. If Arrhenius is right that the physical world must be conceived as infinite, that would also prove the infinity of space. To quote: "The most obvious argument, however, against the finite quantity of matter in space is the fact that the energy of the stellar bodies in the course of infinite time would long ago have been dissipated in empty space so that no luminous stars could further exist."[1] Whether such an argument as regards the give and take of energy proves the most convenient hypothesis, science must decide. It implies the infinity of our particular type of space. It is possible, perhaps, to conceive that our space is insulated by another type of space with opposite properties. Science, however, assumes the oneness of space as well as its infinity, that is, that the properties are the same throughout an infinite void. Such characters of space are, of course, pragmatic, and capable only of empirical proof which cannot go beyond probability. If space, moreover, is infinite, there may be other worlds quite unknown to us, and incapable of making any pragmatic difference to the world as we know it. The law of gravitation and other known laws are based upon finite distances. But perhaps, the science of an indefinite future may have superior tools, instrumental and logical to those known to us; and before these, such problems as those of the infinity and unity of space may yield. For us, these properties are in a large measure conventional, though fitting in with our experience and congenial to the constitution of our minds.

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[1] "The Grammar of Science," 2d ed., p. 271.

[2] Presidential Address before the British Association, *Science*, Vol. XXXVIII, p. 388.

In addition to such properties as geometry and physics apparently have in common, real space has certain properties which seem strictly physical. Such a property is that of absolute conductivity. Negatively stated, this means that space offers no interference, no friction, or viscosity, to the spread of energies such as the rays of light. Light is in no wise interfered with, it would seem, until it strikes opaque bodies. Positively it means that energy does flow from part to part of the universe without loss or absorption so far as space is concerned. The nearer we approximate to pure space in our experiments and observations, the more perfect is the conductivity. It is practically perfect in our vacuum tubes, and in the interstellar spaces. Where there is interference, we can always account for it satisfactorily on the basis of the conflict of energies. If the world of energies must be conceived, whether in the gross or in the minute, as impulses acting over distance, space becomes the conductive medium *par excellence.* We are familiar with energies riding on other energies — electricity riding on material energies, mental impulses riding on neural energies — but the world of energies, as a whole, rides on nothing but space. And the properties of space are such as to harmonize with the law of conservation of energy.

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[1] *Monist*, Vol. XXI, p. 173.

Again, cosmic space is said to have the property of absolute zero with reference to temperature. This would seem, at first glance, to be a merely negative property — the absence of heat, or the absence of motion. "A substance composed of molecules at rest is absolutely cold, and no substance can be imagined to be colder. The absolute zero of temperature is the true zero of a thermometric scale, not the freezing point of water or of any other substance."[1] "The absolute zero of temperature is 273° below zero on the Centigrade scale. The Absolute Scale of Temperature, as it is called, is thus obtained by adding 273° to the temperature expressed in degrees Centigrade."[2] While absolute zero is not heat, but the limit as regards heat, it must, however, like zero curvature, be taken as a real property of space if it conditions the movement of energies in space. Thus it would seem to make a real difference to the radiation and loss of heat. It would have to be taken into account, in connection with such a problem as the possibility of communicating life germs across interstellar space. It would seem, therefore, to be a real limit which must be recognized in the world of behavior.

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[1] Soddy, "Matter and Energy," p. 84.

[2] *Ibid.*, p. 87.

It is evident that if space is a real entity, even though not a thing entity, we must ascertain its properties empirically, as those of other real entities. The properties we have enumerated seem to be such empirical properties. If we can conceive such a space, then it can be real. If we can approximate towards it in our experiments and observations, then it must be real. If it is implied in our practical conduct towards our world, then we have already assumed it to be real. Whether it is exactly as described or whether it has still other properties, must be left for scientific experience to ascertain. In the real world, we deal with probabilities, not with *a priori* certainties.

Objections to Real Space

It would not be necessary to go back to the naïve objections of Parmenides, if it were not for the hold which they have continued to exercise upon the human mind. Parmenides' objections arise from his fundamental conception of reality. For him only inert material things are real. These, however, are not our ordinary sense things, but intellectual abstractions. Their only quality is their space-filling quality, or, as we should call it, impenetrability. It is to Parmenides' immortal credit that he foreshadows in his abstract way the conception of the conservation of matter, and of the conservation of properties. If we grant his premises in regard to "being," his conclusions do credit to one of the greatest intellects of antiquity. If inert, space-filling matter is the only reality, it follows, of course, that empty space and empty time are "unthinkable and unspeakable"; but this only serves to show how limited by custom conceivability is, and how unreliable as a criterion of reality; and Parmenides is not the only one who has made the impossibility of conceiving the contrary the final test. If there can be nothing between the different parts of matter, then matter must lie next to matter, and we have an absolute plenum. We must agree with Parmenides that space is no material thing; but our intellect has been liberated from the conception that only material things are real. We can conceive immaterial energies, and entities which are not even energies, such as pure space. Moreover, we no longer regard matter as inert, but as itself a special form of energy. Impenetrability, the only property conceded by the economic mind of Parmenides, who scorns the wealth of sense qualities as appearance, is itself an energy property, and only known in energy reactions. It is true that the human mind has clung tenaciously to a plenum of some sort. But to say that a thing can only act where it is, is to say that it cannot act at all, for in order for one thing to act upon another, they could not be even an infinitesimal distance apart. That means, that they must be coincident or identical, not only as regards their gross structure, but as regards their minutest constitutents as well. In that case, there can obviously be no motion. So if there is motion, there must be action over distance. This would hold equally for any medium through which things are supposed to act upon each other. Energy is where it does work; and there is nothing against energy radiating over pure space except our ingrained prejudice. Custom makes it seem uncanny. But custom is not a final criterion of reality.

The objections brought by Zeno are directed against the Pythagorean conception of space, as made up of an infinite series of discrete real points. Against this conception, Zeno's brilliant dialectic is conclusive. If space is made up of real points, then the point itself must be in a certain place. This place, in turn, being a real entity, must be located in another place, and so on *ad infinitum*. In such a space, there could be no motion, for a body could not move where it is, nor could it move from one point to another. To do that, it would have to vanish and be recreated, which is not motion at all. The arrow is stuck in its place, transfixed by its position, and it cannot move. Nor would it help us to take large quantities of space as our unit, since these would crumble in turn into their non-extended components. While Zeno's arguments are conclusive against any conception of a real serial space, it does not affect the concept of space as we have defined it. Points here are merely our ideal abstractions, and do not constitute the continuum of real space.

Aristotle's argument against the void is an *argumentum ad hominem.* It is directed against the conception of the atomists. If we may believe Aristotle, Democritus assumed that heavier atoms would fall more rapidly in the void than lighter ones, and would thus collide and form a whirl. Aristotle is quite right that pure space does not account for motion or rest; it accounts for no tendency downward or upward; much less can it account for the different rates of motion as faster or slower, in so far as we abstract from the relations of bodies. Motion and difference of motion must be accounted for by the constitution of the world of energies. Space is neutral to motion except in so far as the conception of distance is involved. Not until Newton's theory of gravitation did it become clear what exact difference space makes in the interaction of energies. And what Newton did in the large has since been done in the small, as in the calculations of J. J. Thomson and others, in regard to the interaction of the electrons within the atom. In antiquity, Aristotle succeeded in discrediting the atomists, and in keeping alive the crude conception of "natural places." Aristotle's own conception is that of figured, continuous extension, "the limit of the surrounding body in respect to that which it surrounds." Hence Aristotle's space is finite, limited by the limits of the world, and conversely it becomes absurd to speak of a space outside of the world, or empty space. Aristotle, in other words, confused space with the geometric qualities of things.

In recent times, Kant's arguments for the ideality of space have in the main been taken for granted. It ought to be said, however, that Kant does not regard space as an individual illusion. It has validity for our social experience, though it cannot be said to correspond to any metaphysical reality. Kant even intimates that for a higher being with a unique power of intuition, space would be irrelevant. Kant's own space concept is not at all clear. He seems to waver between the Newtonian conception of space as a neutral continuum and the Leibnizian conception of space as a geometric system of relations; and this makes his arguments against space far from clear. These may be stated as of two types. His argument in the Transcendental Æsthetic of the "Critique of Pure Reason" is to the effect that space is ideal or phenomenal because it is *a priori*. The space form, with its implications, is innate in our mental constitution, and a condition for our perceiving an external world at all. There is, as we have seen, an element of truth in this. Certain space coördinations have been forced upon the organism in its adjustment to the environment through the evolutionary process. On these coördinations are based the intuitions which play so important a part in Euclidean geometry. But so far from such innateness proving space ideal, it would seem to be a strong presumption for the reality of our space world. And it seems to stand the test of scientific as well as practical adjustment, when the crude intuitions are criticized and verified, as all our intuitions of reality must be.

The other type of argument is implied in the First Antinomy, and is based upon the principle of contradiction. Kant holds that if we try to conceive a world in real space, we land in an antinomy. The thesis of this antinomy is that the world in space must be finite, since we cannot, through any succession of acts, synthesize an infinite manifold. This objection has lost its force with the modern conception of infinite series. The criterion of an infinite series is not that we cannot reach the last term in our successive acts of counting, but that there are collections whose constitution is such that a part of the collection can be put in a one-to-one correspondence with the whole. This obviously cannot be ascertained by successive steps of ordering, but must be proved by an examination of the postulates which underlie the particular type of collection. The number series, among others, is such that any part can be put in a one-to-one correspondence with the whole. We may regard Kant's thesis, therefore, as obsolete. To quote Bertrand Russell: "Owing to the labors of the mathematicians, notably George Cantor, it has appeared that the impossibility of infinite collections was a mistake. They are not, in fact, self-contradictory, but only contradictory of certain rather obstinate mental prejudices. Hence the reasons for regarding space and time as unreal have become inoperative, and one of the great sources of metaphysical constructions is dried up."[1]

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[1] "The Problems of Philosophy," p. 229.

The antithesis of Kant's antinomy is to the effect that the world must be infinite in space since otherwise the world would be related to pure space, which for Kant is nothing at all. This objection is equally irrelevant. Whether the world in space is finite or infinite, it could hold together by its own energy relations. An example of this is the gravitational system which is held together, not by the attraction of space, but by the attraction of masses upon each other where space figures as distance, and so makes a real difference within the system. A world finite in space does indeed raise problems, though not the logical one of inconceivability. We have already spoken of Arrhenius' problem of the dissipation of energy into empty space, without compensation, in such a world. But that is a problem of another kind from that raised by Kant, and implies the reality of space.

Finally, absolute idealism has tried to rule out the existence of space by conceiving reality as, in the last analysis, a logical system. Now we would agree that in a purely logical system, real space can have no relevancy. We would also agree that logical systems must be taken account of as real aspects of our world. The universe lends itself to logical categories. We can formulate the facts of our world into significant systems of relations. But we must deny that logical systems are the only systems of our real world. However important in the field of description, they are abstractions from the movement and variety of the concrete world of flux. In fact, it is because they are abstractions that they are useful in the economy of life. The real unit of reality, we have found, is an energy system; and in this real space figures as an indispensable condition. This is true, not only in the world of physical things, but in the world of personal relations as well. And these must be taken, even by absolute idealism, as final realities, if it is to have any reality at all.

PART IV

TIME AND REALITY

CHAPTER XIV

THE NATURE OF TIME

The Timeless[1]

IN order to understand better the function which time fills in experience, we shall begin by abstracting from time and by regarding reality as a timeless system of truth. Such a world is of course for us as time-subjects a mere hypothetical supposition. All we can do is to abstract from our time-experience as we have it, and conceive it as it would be with time eliminated, given for the time being our distinctions as arisen by virtue of the time-process.

Such a world would be a world of abstract dialectic, such indeed as McTaggart conceives the Hegelian world to be; a dialectic silent as the dance of the deaf; a dialectic without movement or variation of attention, for ideal motion, Trendelenburg to the contrary, is a contradiction in terms; a timeless viewing, where all the stages or ideal moments exist for consciousness at once, and have their fixed setting in an ideal scheme, where reality is included and exhausted in one self-complete and infinite definition, the Idè, the Absolute.

If we have recovered our breath, after speaking such magic and potent words, let us see what place certain categories would have in such a world. The concepts that would have to be retranslated especially in such a world are the dynamic concepts. Take for example the concept of motion. Just think of defining motion as an infinite number of intermediary positions existing at once for a subject. While you may thus shirk Zeno's problem as to where a body is when it passes from one position to another, or how positions can be made continuous, by denying any passing whatsoever, you raise a still more serious problem as to how a body can be in an infinite number of positions at once. In other words, such concepts as motion or change would be meaningless in such a world.

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[1] This section is borrowed in the main from "Time and Reality," pp. 60–63.

Causality in such a world would have to be translated into terms of sufficient reason or logical system. Cause and effect would be identical and both terms would have to be dropped out of our vocabulary as superfluous.

Attention in such a world could be merely the convergence of an ideal system and would have to be expressed in terms of significance. It would be the complete meaning or the consciousness of the whole of itself. Variation of attention would of course have to be ruled out. That the qualitative discrimination, assumed in such a world, presupposes variation of attention and, therefore, time is ignored by the advocates of the static view. We, the abstracting time-subjects, have these contents present to us, and, therefore, can make a timeless synthesis of them.

Activity in such a world we should have to translate, as Spinoza does, into adequate ideas or complete logical definition. Possibility or impossibility would be mere logical abstractions and meaningless, where there can be no creation out of a contingent future.

Past and future in such a world would become mere attitudes on the part of a willing subject. But the meaning has dropped out of both of them, they are mere words, " sounding brass and tinkling cymbal." What could the attitudes of pastness and expectancy mean, where nothing happens?

Non-being in such a world could only mean that one fact or form of being is not another, and the assertion of identity could hardly be made when no question or doubt is possible. It is the seeming flux of things that makes us demand identity. To be honest at all in such a world we should have to eliminate at least a good deal of our vocabulary and the corresponding concepts and judgments.

When, however, we keep in mind that the icy grandeur of this static fabric is the result of our own abstraction and ideal construction, there can be no danger of being led astray. It is, on the contrary, altogether proper to try the logical experiment of elimination, for the purpose of discovering the value and interrelation of our concepts. Abstracting certain concepts from concrete experience only keeps them in abeyance (*aufheben*), it does not destroy them. We have all the while in the background the inner wealth of concrete meaning, which gives value to our abstractions.

If, however, we take our timeless construction seriously, if we hypostatize it into a world, as so many philosophers have done, we shall land in hopeless contradictions. In a really timeless world, in a world of no activity and no process, there would not only be no dynamic judgments, but no judgments at all. As far as we know at any rate, the arising and development of consciousness would be impossible except for the ever present necessity of adjustment on the part of the organism to a complex and changing environment, in order to realize its needs. Concepts are developed as tools by means of which we may be able to seize upon the relatively permanent in the fleeting changes of things and thus anticipate the future. The psychic content becomes detached from the perception, because the perception has disappeared, and the psychic content thus torn loose becomes symbolic, for the reflective subject, of all similar situations. Without time-process, therefore, we should have no meaning, no judgments; we should have simply the glassy stare of the mystic One, which again is nothing except for our choosing to posit it.

All description must indeed be abstract and timeless. Such description is necessary for the highest possible coördination and adjustment. Without description, social coöperation would be well nigh impossible. There are two dangers, however, that we must guard against.

One danger is that of being satisfied with an incomplete and provisional description. While description is not reality, it should furnish us with symbolic equivalents for reality. The timeless description has made absurd the facts it was invented to make intelligible. But a description which lands us in hopeless contradictions is obviously a failure. We must look again for the elements which we have missed. We must have faith that the universe is amenable, at least, to consistency; and seeming contradiction must be a challenge to us to revise and complete our ideal network of symbols.

A second danger lies in the tendency to hypostatize our description as reality. This has been the danger alike of idealism and realism in the past. Democritus hypostatized his hypothetical atoms, and Herbart his qualities, no less than Plato his impersonal ideas and Hegel his Absolute. We must not forget that reality at heart is individual and that, however far we may carry our conceptual analysis and synthesis, it can never exhaust the "acknowledgment" of unitary wholes which only will and appreciation can create for us. This individual core of being must always remain a limit toward which description approximates, but which it does not reach. The conceptual function, in other words, must regard itself as the instrument by means of which the willing and appreciative self strives to become conscious of itself and to realize itself. It is not an end in itself.

The real is the finite, the fleeting and perishable, the permanent is the abstract and symbolic.

This is but his shadow,
His substance is not here,

may be said of all our ideal abstractions. This means a reversal of the idealistic emphasis from Plato down. Instead of

Alles Vergängliche
Ist nur ei Gleichniss,

I would say that the eternal or conceptual is only a poor copy or symbol of real life.

Grau, teurer Freund, ist alle Theorie,
Und grün des Lebens goldner Baum.

With this introduction it devolves upon us now to seek for the missing element, which may free our above description of reality from its contradictoriness. If we cannot eliminate time, what function does time play in reality? We cannot treat it as a mere illusion, for illusions, too, must be explained; and it is hard to see how the illusion of time and change could arise in a static world. Rather must we agree with Aristotle that motion could not originate from non-motion and so must have an eternal basis in the nature of things. This seems to be implied in the general scientific assumption that motion is a universal property of matter, for by motion in this case science cannot mean the mathematical concept of motion, which implies space, mass, and time, but it means the fact of change, the real time-character of our world.

Time and the Psychological Present

J. S. Mill, in his "Examination of Hamilton" raises the question of how the past and the future can coexist in the present. That they do so, he regards as a fact; but how they can do so he regards as an ultimate mystery. We may state the difficulty in the form of an antinomy:

1. Such is the nature of time that when the present is, the past has been and the future is not yet. The present is a mere point or ideal boundary making the past continuous with the future, but having no duration of its own. This is the character of time which Aristotle lays down in his "Physics."[1] It emphasizes the non-being aspect of time without making a clear distinction between this and the quantitative and serial character. This gives us the mathematical present, which is a mere limit or zero.

2. But the past and future must coexist in the present, else how can they be contrasted in the act of judgment or *mean* past and future? Past and future are for introspection present attitudes. Time therefore must be an ideal order, having its basis in the qualitative character of the present moment. This is the horn of the dilemma emphasized by metaphysical idealism. Since *our* present is at best fragmentary, the total time-order must correspond to the qualitative content of an absolute mind in which all the moments of experience like a melody can be intuited at once. If the former attitude gave time no extent, this attitude gives it an infinite extent; but in doing so it loses the fundamental character of time, *i.e.* a sense of passing, of coming and going.

The concept of the psychological or "specious" present has been proposed as a compromise between the attitudes already stated. On the one hand, the present, according to this view, is not a mere zero or ideal limit. The past and future are our attitudes to the waning and rising processes which really do coexist in the stream of consciousness. The present has a certain extent of duration within which the passing contents can be held together within one span or attention-moment. This span may vary from a fraction of a second to several seconds in its extent, depending upon the conditions which obtain. At any rate, the psychological present is a complex affair. In the words of Robert MacDougall: "The whole group of elements constituting the rhythmic unit is present to consciousness as a single experience; the first of its elements has never fallen out of consciousness before the final member appears; and the awareness of intensive differences and temporal segregation is as immediate a fact of sensory apprehension as is the perception of the musical qualities of the sounds themselves."[1]

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[1] Aristotle, "Physics," Book IV, Section 10.

There seem to be two factors of which we have to take account in order to understand our psychological sense of duration. One factor is that of attention-strain, the other factor is that of the filling, or content of the intervals of succession. One cannot be reduced to the other, though they may have their effect upon each other. Our sense of duration seems to vary independently with each. The greater, on the one hand, the attention-strain, the longer seems the time. This can be illustrated by any case of tedium or frustrated expectancy. On the other hand, the more filling, the longer seems the time. This is true, not only in retrospect, but it is true for our immediate sense of duration as well. It used to be thought that relatively empty time seemed long and that full time seemed short. But relatively empty time when it fills the momentary interest, as when one dozes away listlessly for the time being, seems remarkably short, while full time makes the duration seem only longer for being full.

The stream of duration has been compared with the physical stream with its bed and its moving flow. The bed in the case of the psychological stream consists in the relatively stable contents and tendencies; the stream is the coming and going of contents. The permanent background of consciousness consists in our impulses and tendencies, on the one hand, and the mass of organic sensations, usually unnoticed, on the other hand. The rhythm of some of the organic sensations gives us a more or less constant measure of immediate duration. It has been shown that *visceral anæsthesia* produces a lack of sense of duration, while the undisturbed constancy of our organic rhythms in passive attention gives us the original of Newton's uniform flow of time. Again, the rhythm of the perceived content makes a difference: "When a series of stimulations (auditory for example) runs off without any decided rhythm of grouping, the specious present maintains an approximately fixed length, or, at least, the variations in its length have no functional relation to the series of stimulations in question."[1] With rhythmic stimulations, however, the pace of duration may be shortened or lengthened; the immediate span can be made to contract or expand in sympathy with the rhythm of the stimulus. It has been shown experimentally that nerve currents respond to physical rhythms up to about five hundred pulses per second.

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[1] Harvard Psychological Studies, Vol. I, 322.

Certain contents or tendencies may persist through an indefinite number of these briefer spans and thus mark off our sense of duration into longer periods or time-wholes. These tendencies may be primary, as where, on the perceptual level, certain impulses or instincts, like hunger or the migration instinct, persist and so mark off rhythmic periods. On the ideational level certain ideas or purposes endure through the moving scenes of perception and imagery, emphasizing and selecting the relevant contents, until brought to a consciousness of completeness. Beyond this immediate sense of duration, however, our serial location depends mostly on indirect considerations, such as the association of our flow of experience with the artificial chronological units. We cannot rely on vividness as the sole criterion of distance from the present. Even in individual history some events far removed, such as childhood experiences, may be more vivid than those that have recently transpired.

The account of the specious present, as we have tried to give it, is merely a statement of our consciousness of duration; it does not explain it. What the specious present means in terms of content is that a certain context of content or tendency remains practically constant, while other contents come and go. This may be a matter of seconds or of years in accordance with the identity of interest which spans the interval. Pathologically we see it in the persistent idea. Normally we have it most clearly in the realization of purpose, where a nuclear content furnishes the permanent leading throughout the process of realization. The so called time-whole is the stream of tendency controlled and bounded by a purpose, such as the drama, college life, etc. In ordinary passive life, even when our minds are most vacant of content, there is, on the one hand, the background or stable nucleus of the organic sensations; on the other hand, certain motor rhythms of strain and release mark off the stream and help to constitute the sense of the specious present.

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[1] Dunlap, *The Jour. Phil. Psych. and Sci. Meth.*, Vol. VIII, p. 348.

This sense of duration or stability of certain contents in the stream of change, so far from being identical with time, as some have maintained, is its antipodes — the eternity aspect of experience. The time character is bound up with the coming and going, with the passing and novelty of the process. Thus in every moment of experience, the eternity aspect of constant and cumulative content is present together with the time aspect of fleetingness; and it is on the background of this limited eternity-consciousness that we catch the significance of time, as it is on the background of the dark space of night that we catch the significance of the fleeting and dying sparks.

Time is the precondition of the consciousness of before and after, as space is of the side-by-side. The consciousness of before and after is the simplest consciousness of time-process, the most immediate time relation. But it is not time any more than the minimum extensible is space. Rather time is the condition which makes possible the consciousness of before and after, of the sense of passing as opposed to simultaneity. Upon this consciousness of before and after we build our artificial framework of chronological systems, infinitely outstripping the brief immediate span of a few seconds but none the less deriving their content from it.

Having stated briefly the psychological aspect of the specious present, we must say a few words about its metaphysical import. What is the character of this changing process which we thus immediately intuit? Is it continuous or is it discrete?

Is there one general flow of duration made up of infinitesimal parts or is this duration essentially a discrete affair, coming in finite drops?

That we have an intuition of a continuous duration is the opinion of Bergson. According to Bergson[1] all our ideas are in constant flux. In this flux, our psychological states are continuous and cumulative. It is only to our attention that they seem discontinuous and successive. It is in our immediate intuition of this psychological stream that we get the inwardness of reality. But by means of concepts, the intellect tries to piece together in the form of static pictures what psychologically and in fact is a continuous flow. It thus gives us a cinematographic substitute for the movement of reality. He contrasts time or real duration, as absolute qualitative change and interpenetration, with space as the image of the coexistent, quantitative, and divisible. All contents are continuously flowing, nothing remaining constant, however infinitesimal may be the period elasped. Our qualities are but tangents to the ever moving stream. They do not characterize the stream. What repeats itself is the spatialized image. The abstracting, stereotyping intellect is thus incapable by its very nature of taking account of reality. This can be done only by intuition, the immediate sense of the ceaseless flow in which the contents continually melt into each other as the tones blend into the melody.

While Bergson, and his master Renouvier, thus assume a continuous flow of consciousness, with infinitesimal increments of altering variation as filling the intervals of duration, our ordinary psychological evidence at any rate fails to verify such an intuition. Renouvier and Bergson have both been misled by the divisibility of quantitative intervals into assuming the continuous change of all our contents. This is a purely *a priori* assumption. The divisibility of the artificial units of time measurement has nothing to do with the change or constancy of the real contents of experience. Their constancy or change must be ascertained empirically. That some of our contents are practically constant, the truth process itself implies. Else how could we *mean* change?

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[1] See the beginning of "Creative Evolution." The strongest statement of Bergson's position as to time is to be found in his first book, "Time and Free Will." A brilliant sketch of the temporalist development in France may be found in a series of articles by Professor A. O. Lovejoy in the *Philosophical Review*, Vol. XXI, under the heading, "The Problem of Time in Present French Philosophy."

So far from our being able to intuit infinitesimal increments of change our ordinary consciousness of succession is decidedly limited.[1] Our conscious processes, so far as we can take account of them, come in finite drops, whatever continuity there may be in their physiological and physical conditions. We must here proceed pragmatically, following the leading of the evidence and not of *a priori* assumptions. While Bergson has warned us against spatializing psychological processes, this seems to be what he himself has done. Having started with quantitative intervals, he has proceeded to apply the infinitesimal calculus to the contents and to force the facts to obey its infinitesimal rate of change. What we must do, on the contrary, is to discover, so far as we can, such change or constancy as there is, and then to apply our mathematical tools so far as may be convenient. We must take experience, as we find it, with its constancies and its flux. Our knowledge of either is far from warranting any assumption of absoluteness. To dogmatize about absolute flux is only to substitute another kind of absolute for that of the Eleatic. The former may be more fashionable; but it is not necessarily any more scientific. Because we find some flux, we have no more reason to assume absolute flux than we have for assuming absolute constancy everywhere because we find some constancy.

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[1] I undertook an experiment on the perception of sound succession, with the coöperation of my friend Dr. Bruce V. Hill, a physicist, some years ago. The click of a telephone was used as the stimulus. As the experiment has not yet been published, I can here give only the preliminary results. We found that distinct intervals could be perceived by the practiced ear up to about $\frac{1}{100}$ of a second, our best record being .0064 by an expert musician. After that the successive stimuli were discriminated from the simultaneous by the lengthened impulse or "rasp" of the former. Toward the upper limit of any discrimination at all, the successive stimuli furnished, not a longer sound, but a "thicker" sound; and to one or two musical subjects there seemed to be a slight difference in pitch. The upper limit for any discrimination at all as between successive and simultaneous stimuli could by practice be made much higher than that of Exner (which was about $\frac{1}{500}$ second), the highest limit with us being .00144 of a second. This, however, was not a discrimination of succession, as Exner supposed. And even so it is a long way from an intuition of infinitesimal transitions, which Bergson seems to assume.

The Temporal and the Eternal

Some of our contents as observed in experience seem to overlap our ideal divisions of moments. On the other hand, intuition indicates that some contents are changing. Our quantitative intervals of duration, moreover, do not exist to be filled by our calculus of flux or our plenum of being. They are but a tool for describing the concrete process. An examination of the specious present brings us face to face with an antinomy:

1. We have the intuition of flux. Contents come and go. Our attitudes and meanings change. If it were not that our world is a world of flux, we should have no need of science or prediction. To try to derive this flux from a static world is absurd. Somewhere there must be change and variation for even the illusion of time to arise.

2. But we also have the intuition of constancy. We do recognize contents as the same. We are able in a measure to predict the course of process. Were there no constancy, we should have no concepts, no science. We should neither recognize our original experiences nor the pictures of our original experiences. We should not be able to mean change or anything else, for meaning implies the selection and persistence of certain abstract contents, in terms of which the concrete situations can be defined.

The dogmatic temporalist and the dogmatic eternalist thus come to a draw, if not to blows. Each rests his case on intuition and conviction. And intuition verifies each and belies each in turn. If the dogmatic eternalist insists that only the intuition of substance can be trusted and that change is an illusion and inconceivable, the dogmatic temporalist naturally retorts that it is only the intuition of change that can be trusted and that constancy is somehow an artificial affair. Nor is the situation altered by substituting for the world of the naked senses, the world of the microscope. The values are different to be sure, but they still furnish our intuition with the same antinomy of change and constancy. If they didn't, we should have no intuition at all. Perception as a subjective act implies both process and a fairly constant context.

The only solution of the antinomy which is open to us is the pragmatic one. We must take both change and constancy at their face value. What saves us from contradiction is that they do not hold in the same respect. The perceptual context perhaps changes, while the memory context remains practically constant. The meaning is still the same, though the parchment has faded. Or part of the perceptual context is constant, while part changes. The outline of the leaves and their spatial context is the same, though they have assumed their gorgeous autumn hues.

In our world at any rate the thirst of the will for novelty is abundantly satisfied, but there is also an opportunity to realize the demand for loyalty. We must take each from our finite point of view. What is novelty to the child in its learning process — the art of reading and writing, Mother Goose, the multiplication table— is from the point of view of the maturer person part of the world's constant stock in trade; only the individual value, to the beginner, is here novel. From the point of view of a still superior experience the content which is novel to us may be as old as the world, and what we take for constant may make the angels stand back and wonder. In the meantime we must evaluate the world from our finite point of view.

In general what is most liable to change is the concrete, and what we find to be most constant is the abstract. Somehow, in the midst of the stream of concrete flow, certain forms and qualities seem to persist. In all the variety of our thinking the same fundamental laws hold good, and so we can have social validity. In the midst of the endless variety of chemical compounds with their unique individuality, certain qualities or elements can be analyzed out, and so we can have description and prediction. In the midst of the changes and chances of history, certain fundamental *motifs* seem to be present, and so we can read history at least backward and utilize the experience of the past in present emergencies. However much, therefore, the concrete contexts of reality change, the abstract ratios and laws seem to hold within the observed conditions of the flux. For new conditions, fresh observations and generalizations must be made. He who enters the temple of truth must leave his dogmatic absolutes in the outer court, though temperamental bias will always make this difficult.

One thing seems clear, whoever acknowledges time and process to be real must be an empiricist. He must recognize that, if time is real, it may creep into all our generalizations, including our theory of time itself. And while time cannot "fall on its other" and annihilate itself, it is likely to annihilate many of those prejudices which we now mistake for truth. We must take our truths for their practical value for the time being, with due tolerance for other points of view.

Instead of making time have the whole thickness of reality, as Bergson does, and insist that all our contents must flow absolutely or accumulate absolutely, I have taken time as a very thin concept. Time is not the whole of reality but an independent variable or attribute of reality. But if time is an independent variable, so is stuff, too, an independent variable. Various ensembles change unequally because of their own inherent character and organization. And some characters and relations there may be which, while they exist in the flow, still remain independent of it. Certain logical and spatial relations seem to be thus independent. The formula, 2 plus 2 equals 4, once discovered seems to be timeless. The secret of independence from change lies, in any case, in the isolation or abstraction of certain parts from the concrete stream of individual history. This may hold for concrete parts as well as formal aspects. Water imbedded in certain crystals and isolated for the time being from the other energies of nature may remain essentially unchanged in quantity as well as quality for thousands of years. The will, embodied in certain artificial vehicles such as the instruments of language or of marble and thus taken out of the individual stream, retains its own individuality unaltered, through the flux of ages. How far anything remains finally eternal can only be made clear in the historic realization of human purposes.

In such a world the processes of reality will change continuously or discontinuously according to the complexity of its plural structure. We cannot deduce from the mere concept of time which they will do. Nor can we deduce from the mere concept of time, as Bergson does, that the process must be absolutely cumulative, so that each moment like a rolling snowball owns all that went before. Our finite practical experience does not seem to carry out this assumption. Is old age the cumulative net result of childhood with its plasticity; youth with its enthusiasm; manhood with its vigorous purposes? Our finite life is leaky somehow. It is more like a net than a snowball. Some of it is cumulated, but the meshes get loose and break afterwhile and life's contents ooze through. The permanent part is the *Karma*, the net result of tendency.

As we float in the sea of change, whether in mystic acquiescence or struggling in practical earnestness with its forces, some constancies are indeed recognized, enabling us to hold our heads above the stream and to satisfy our need for prevision or thought. We must not forget, however, that these constancies are only relevant to a universe of process. And the fluency of this process, not its constancy or measure, is what I understand by time. If we must recognize reality as having such a flowing, passing, novel constitution; if we must orient ourselves to our world in such a way in order to realize the purposes of life, then such it is. And our conceptualizing faculty, instead of demurring and saying it cannot be, must accommodate itself to the facts. It must recognize that it is in just such a world that it has its peculiar function of leading.

The Pragmatic Character of Time

Whether we regard space as subjective or objective, we all agree now that space must be such as to make no difference to the character of things in space. It enables us to spread these out, and herein lies its convenience, but it makes no intrinsic difference to the facts thus spread out. Free mobility is one of the few axioms that critical geometry has left standing. Logically, therefore, we can easily abstract from space. But not so with time. Whatever theory we may hold as regards time, it must be admitted that time alters our contents, making an intrinsic and not merely an external difference. So far from the axiom of free mobility being applicable to time, reality, in so far as time pertains to it, is by all agreed to be irreversible. Contents become less vivid and distinct, assume different values and, above all, bear a different functional relation to the present subject. This has made even those who with Kant regard time as subjective speak of it as an irreversible series, though irreversible is applicable only to process, not to series. How a subjective form can be irreversible passes understanding.

Leaving out all dialectic subtleties, let us try to define the fundamental character of time. The difficulties besetting one's path on such a quest are due in part to the confused character of the concept as we find it in common-sense thinking, but still more to the idols of the philosophic tribe. From Zeno down to Bradley it has been taken for granted that time is serial in nature, and the arguments for and against its reality have always implied this serial character. Assuming time as an order series, Kant was the first one to show that time must be ideal. That he also regarded it as irreversible and as a condition of moral activity does more credit to his insight than to his consistency. Since Kant, idealism, using the Kantian weapons, has made short work of a real serial time. I agree entirely with the Kantians that if time is serial it must be regarded as an ideal construction. But I also hold that philosophy has emphasized the wrong aspect of the somewhat ambiguous common-sense concept. The flying, fleeting, evanescent character of experience, it seems to me, is the primary character of time. The serial character is secondary, and is the result of *a posteriori* construction, necessitated by the real time character. We construct past and future because our contents *have* the time character, because they are forever going and coming; contents do not come and go, arise and fade, because of our series.

To define what time is we must discover the *differentia* of time. We must get over our intellectual slovenliness in simply dumping things together. This is especially true of time. We have been too prone to be satisfied when we have reduced it to one dimension of space, to number, to quantity, to causality, to will, and what not, if, indeed, we have gotten beyond identifying it with the stream of consciousness as a whole. No doubt the time concept has important relations to all of these concepts. But these relations are obscured by the neglect of differences which fail to give the time concept any assignable significance.

Such obscurity makes time as a logical tool for describing experience worse than useless. If the time concept makes no difference to experience, let us drop it out altogether. Using the pragmatic test, then, let us see what difference time makes to experience.

Do you say that time is a series? Then by what mark or *quale* is time as a series differentiated from all other series concepts? To illustrate by another concept, more familiar: If you say, for example, that geometric space is a complex of series, you have at most mentioned only the genus. This would not differentiate it from color and taste series. If you say with Riemann that it is a manifold, you have again furnished only a large genus. Obviously what differentiates geometric space as series from the other series or group concepts is that it is an ideal construction of *extensive* data or is an *extensive* manifold. Extensity is thus the character that differentiates space series from other concepts of the kind referred to. If we now return to time as serial, we must here, too, discover precisely what difference it makes as a concept, what marks it as distinct from other series concepts. The answer you get when you ask: What sort of a series is a time series? is something like the answer of a friend when you ask him: When are you going to Chicago? and he replies: Who says I am going to Chicago? Or the answer in algebra to the question: What positive quantity results from adding 4 and – 8? and you get the answer – 4. The answer here shows that the question involved a wrong presumption. So with the answer to the question: What are the differentia of a time series? The answer is: A time series is a series in which contents keep passing out and coming in and in which no position can be defined with reference to any other position, because every position is shifting in value with reference to every other. In so far, in other words, as you want to have a series with definite positions, in so far you must ignore the time character of experience. In so far, again, as you let in time, your serial construction fails to define. The answer to the question: What sort of a series is time? seems to be that time cannot be expressed as series at all.

We have said that the test of the nature of time must be the difference it makes to experience. The term experience, however, must be narrowed down for logical purposes. There are several types of experience and reflective experience is only one of these, no more real than the others. But what we are concerned with here is reflective or judging experience. The question is: What difference does time make to our judging experience and to other forms as reported to this? Evidently time bears a peculiar relation to the law of contradiction. The law of contradiction is only applicable, as a matter of fact, if you exclude time. The law of contradiction says that different judgments cannot be made with reference to the same point in our space system and in the same respect. But that an object can be white and, where it is white, be not-white; that a thing can both be and not be in the same place — are matters of everyday experience. A theory of a timeless universe would break down under its own contradictions. Time, then, is that aspect of experience which makes it both possible and necessary to make different judgments with reference to the same point in reality and with reference to the same attribute or within the same universe of discourse, *i.e.* to judge that reality is both white and not-white, warm and not-warm with reference to the same point in space. Here the law of contradiction is not violated. It simply finds a new dimension by means of which incompatible judgments can refer to the same objects, without proving destructive.

The so-called law of universality proves equally an abstraction. Once true always true could only hold in a timeless universe or by abstracting from time. Experience shows too clearly that neither facts nor meanings have absolute stability. All that *our* world seems to yield is such relative universality and uniformity as enables us to come in a fair way toward agreement and to anticipate for practical ends the processes of nature. Thus the relative and instrumental nature of knowledge becomes evident.

What I have tried to show is that time does make a difference, and that the difference it makes is that we must revise our judgments or make new judgments in order to meet the requirements of experience. If time made no difference, if experience could be described as well without it, then we should have one eternal moment of reality with a timeless scale of values. Once seeming true would be always seeming true in such a world.

Time may be spoken of as a non-being character. That does not mean that time is unreal. What time *does* is something positive. It is responsible for passing away and novelty; it creeps into the intended reality and so makes necessary new judgments. What I mean by placing it under the category of non-being is, that it is not a thing or energy, though it makes positive differences to the world of energy. Could we state reality through and through in terms of quantitative determinations, in terms of constancies and repetitions, we should have no use for time. Our judgments as regards the factual character of the world, if once true, would not need to be revised.

Time bears a different relation to knowledge from that of the stuff character of reality. The stuff contents of experience, whether individuals, qualities, or relations, have a *place* within experience; they are particular and can be set off from other contents, or pointed to. Blue is not only describable as different from other contents or like other contents, but can be indicated as a particular blue fact as well. Not so with time. Time is known only through its other. If we say fleeting or passing we must think of fleeting values, not of fleeting time. It is the instability of our facts and values that makes us suspect the presence of the time character. The evidence for it is thus altogether indirect, *i.e.* in the difference it makes to our meanings. To try to point to the time character, as we point to blue or red, would be like the schoolmaster's saying: "I see some boys that are not here."

Time knows no proximate genus under which it can be subsumed. The only universe of discourse that can be framed for it is reality or the process of experience as dichotomized, on the one hand, into being, — the world of positive facts and values, which can be held apart from their context, indicated or pointed to as well as described in terms of their other, — and, on the other hand, into the negation of being, the transmutation of facts and values. In the process of experience being and time are thus inseparably locked into one Hegelian, Kilkenny-cat embrace. This ought to satisfy even the most voracious Hegelian appetite for opposition. But there is nothing mystical about the time character. To thus negate our meanings, to make our judgments false and so to make new judgments necessary *is* precisely its character. I have spoken of time as non-being, not because I regard it as unreal, but because it negates that which is. If we were to find a cold, logical equivalent for the warm transitiveness of our immediate experience we should be obliged to call it the non-identity-of-what-is character. That is a very cumbersome adjective, but that is what it *does*.

Accounting for transmutation as due to the time character may be regarded as a lazy way of getting rid of the responsibility of describing the changes or sequences in our experience. Not so. Transmutation in general does not account for any particular transmutation. The fact that physics has assumed motion as a universal property of bodies has not saved it from the responsibility of investigating the laws of motion and describing the particular sequences. That time is a property of reality simply means that facts are unstable; but *how* facts shall be transmuted, the quality and rate of transmutation, must be explained by their own structure and their place within the system of facts. The concept of change in general stands in the same relation to the particular changes that the demand for law in general stands to the particular laws or connections.

The time character must be defined as absolute negation in order to differentiate it from the negative judgment as ordinarily employed. The latter has reference to contrasting being with being. The time character does not have to do with the fact that there are coexisting differences or that we must now make different judgments in regard to reality. Rather the time character has to do with difference that creeps in at the same point. It is a property of all concrete reality; not only an attribute of reflective experience, but of reality whether it is reflective or a lower grade, *even* when, perhaps, in its own right it cannot be characterized as experience. It makes such a difference to reality for *us* that we must make different judgments of what would otherwise be the same. By absolute, therefore, is simply meant that time is a *real* property of our experience-world, subjective and objective, and not a derivative of being in any form, as the Hegelians would have it. It cannot be deduced by any *a priori* dialectic, but is forced upon our will in trying to meet its world. It is irreducible as red and sweet are irreducible qualities of experience; but, while these are specific contents which can be marked off and indicated, the time character is a generic adjective, a universal attribute of reality. It is the seed of instability that must be conceived, not to account for any particular motion, change, or variation, but for motion or change at all. The particular transmutations or changes must be accounted for by the character of the existing system of being, given this all-pervasive property of time.

I have tried thus to give the concept of time a very specific and technical meaning in our logic of experience. Not that I have been arbitrary in this. On the contrary, I have tried to unravel the character which time has in the common consciousness of man, confused though that consciousness may be. It is also the character which we need in order to make our description of experience consistent and complete. We can thus produce conceptual continuity and flow in the previously static and discontinuous categories of our logic — thus make the wheels of experience go round *in thought* as they do *in fact*. While our logical system can in no wise be a substitute for the warm and concrete process of experience, it ought to furnish a complete symbolism for concrete experience.

I have two quarrels with idealistic theories so far. One is that even though reality for us must be thought of as experienced yet all experience is not reflective, and cannot therefore be reduced to the conceptual type. Concepts, in relation to a large part of experience, retain an instrumental or tool character. They are, with reference to non-reflective experience, merely symbolic equivalents in the service of the willing, purposive moment. But my other quarrel is that the ontological conceptualists have failed to make their conceptual scheme exhaustive. Hegelian dialectic at best keeps jumping on one leg in its attempt at a static scheme of reality. Its non-being is not differentiated from being. But we need the negative concept as well as the positive. The relativity of meanings is as obvious a fact as that we have meanings. This relativity of transmutation cannot be exhausted dialectically within the implications of one eternal system, but is the character of experience as ascertained *a posteriori* through the failure of our meanings to express what they mean to express — the nature of a changing reality. Not one system of meanings, but ever new systems of meanings are required in our world. Thus reality as concrete out-Hegels Hegel and makes ghosts out of our logical absolutes.

I know this definition of time will seem abstract to my intuitionalist friends; and they are right that we must not mistake abstractions for realities. But without abstraction and conceptual construction we should have no science or philosophy. We should live simply in the immediate moment. It is by the method of abstraction that we discover what difference facts make to each other within our world. Truth, or conceptual analysis and construction, is the means through which the concrete will strives after greater completeness of insight and appreciation. It is this concrete and active self which constructs the past and future to symbolize its own conditions of activity as a time subject. It is this concrete self which is conscious of *direction*, because it is conscious of purpose; to which the data and habits of the now are only a means toward the realization of its demands for unity and wholeness; and for which, therefore, the death of the old meanings means the birth of new meanings better expressive of its concrete life. In this willing, purposive, changing ego, not in abstract systems of categories, lies the principle of negativity through which experience is ever transcending the old meanings, and ever reconstructing itself in terms of new meanings and systems.

There is a proper and improper use of the implicit. There is one type of reality in which idealistic procedure from the implicit to the explicit is at home, and that is in the case of purposive wholes.[1] We must take account of the various elements or moments in a purposive whole as indicating the next step

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[1] For a lucid treatment of the implicit from the eternalist point of view, see an article by Professor J. E. Creighton, "The Notion of the Implicit in Logic," *Philosophical Review*, Vol. 19, pp. 53–62. This deals with the subject from the retrospective point of view of the cognitive moment, not from the point of view of the creative process where each stage is individual, and must be recognized in its own right with its own categories.

— the next note of the melody, the next act of the drama, the next step in the argument. Wherever facts are parts of a completed whole, they must be prospective; they must point forward, even though they do not get their definite meaning until they are seen in their fulfillment. There is a timeless identity in a purposive whole, and the meaning of the parts is fixed by their already determined relationships. The novelty here exists only from the point of view of the learning process. There is no real novelty in Hamlet. It is different with the creative process — the creation of Hamlet, the construction of the argument, the organic growth process. Here there are genuinely new steps. Here insight grows. A new individual context is created. To think of the chicken as timelessly implicit in the egg, which is somtimes true, is not a very palatable idea. In a really edible egg, they are indeed part of one creative growth series, but they are different individuals, and must be taken differently. We have nothing to do here with a quantitative time whole. This cannot condition growth or realization. We have to do with real time. It is with the reality of change that time is bound up. In the case of processes, which to all intents and purposes are reversible, or which like a purposive construction can be viewed at once, time is reducible to pure series, which simply means that you have practical timelessness. Time is not here efficacious.

While it is through the difference which time makes to our purposive striving that we come to know the character of time, I cannot agree with Royce that time itself is "primarily the form of will. And so a time sequence viewed as it really is, that is, as a rational being really wills it to be, is viewed as a sequence of novel and individual events, each expressing somebody's present will to do something unique, and to find its place in the world."[1] What about the tragedy of finding difference where our loyalty demands sameness? Moreover, our willing of the new does not itself create it. The will at best projects its present desire, its present intention, into the future. For the novel, we must wait. This is the creative contribution of the time process of which we are a part, and in regard to which in the words of Hamlet, "the main thing is readiness." When this new comes, it may affect our willing, as well as the object willed.

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[1] *International Journal of Ethics*, April, 1910, p. 262.

I do not see how we can be said to will what we do not now will or intend what we do not now intend. The new meaning, however minutely we may analyze the conditions of its appearance, must be looked at as a gift; it is not taken simply out of the whole cloth of the old. It cannot be predicted, therefore. It can be known only *a posteriori*. This new meaning can no longer own the past except as it has been transmuted and lives in the present meaning, as looked at from its point of view. In it is the hope of the future which can only come through the death of the present, "when we dead awaken."

There is one way in which the temporal pluralistic view has the advantage over the static in its relation to the will and its striving; and that is in regard to promise for the future. In such a world mistakes are not irremediable. Errors can be corrected, illusions can be set straight, evil can be overcome. In a timeless world the presence of wrong and perverse viewpoints at all is a standing disease which cannot be remedied. The timeless sin of Brahm in begetting *Maya* knows no logical redemption at any rate; and the mystical solution is at best a veiled way of denying the original premise and recognizing the value of process. The temporalistic pluralist can take a melioristic view of the world, however long and discouraging may be the journey from brute to God.

To be sure this advantage has to be paid for, like every advantage in our finite world. In a temporal world there is no guaranty that the future, at least so far as the finite individual is concerned, may not be worse than the past. There is a tragic element in the blindness and groping in such a world, which the absolute world of the eternalist does not know. But this temporal world seems to be our world, and so we have to make the most of it. It is a world at least where the sincere, courageous man can count — can help to create his own future.

Time and the Judging Process

We have seen that the character of time must be the difference it makes to our judging process. It is evident, however, that time does not pertain to the individual act of judgment. The parts of the judgment are not separated in time, though it takes time to speak the judgment. Each judgment is a timeless synthesis, involving an ideal reference or interpretation, abstracted from the time process. Let us examine somewhat more in detail the relation of time to the process of judgment.

Without recognizing the reality of time, the judging process itself would be impossible. The act of judgment presupposes that certain aspects have been torn loose from reality; that contents, more general and permanent than the rest, have been discriminated, and abstracted in the process of experience, and have become symbolic of other contents. In a static world, where being lies next to being in one glassy stare, distinctions between thought and reality could never arise. Meaning and object would be inseparably agglutinated, if, indeed, you could assume meanings at all in a world where conduct has no prospective significance. Judgments are progressive adjustments, which are possible only in a world where the individual is dependent for the satisfaction of his nature upon centers of reality beyond his own, and where, through a process of interaction, supposition and verification, the fittest adjustments survive, and make it possible for him to meet, at least approximately, the demands of the other centers upon him. Judgments, therefore, both as regards their genesis, and as regards the testing of their validity, presuppose process and plurality as involved in the constitution of reality. The possibility of judgments at all presupposes negation, not negativity in general as an abstract logical category, as Bosanquet has it, but real, dynamic negation — transmutation as opposed to static positions within a system.

Suppose, in the first place, that we start with our system of truth meanings. To be sure, this is an inverting of real procedure, for such a system of relations is a way which the purposive time stream of tendency has of objectifying itself, of making clear its trend. But by starting with the truth system, we can the more easily discover its relativity, and so find the neglected element. Now, in thus positing the system of truth relations, we come up against the fact that they are often unstable; that while we intend that our meanings and values shall be eternal; while we try to freeze reality into a static mold, it will not stay. It melts. Time creeps into our system, and we must revise — perpetually revise — our concrete meanings. The rationale of this instability, whether subjective or objective, must be found in the nature of the real world. But it can only be made part of our system of truth *a posteriori*, as it falsifies our meanings, eternal though they intend to be.

Secondly, many judgments or concepts, we have seen, can become intelligible as regards their own specific significance, only if we presuppose such an attribute of real non-being. Such concepts or attitudes as past and future are not exhausted in our ideal spreading out of our memories and expectancies. In a static world, memory and expectancy would be alike meaningless. In human experience, at least, there is real vanishing of contents, and real novelty. Contents come into, and slip out from our attention field. There is a transmuting, at least of our context of significance, whether the real objects change or not. And this negation is part of reality. Not only is this true of the concepts which in a special way are bound up with the time character, but in the case of other fundamental concepts also the reality of process, with its implied negation and novelty, is presupposed. Thus physical continuity becomes unintelligible apart from process, apart from the fusing of one positive characteristic or position into another, as for example in the motion of the point in drawing a line. Positions must be looked upon as abstractions from a continuous process. Even geometrical space, the type of the coexistent and the eternal, at least in so far as it presupposes continuity, implies motion and hence implies time. Number presupposes cumulative process for its significance. The number consciousness would be impossible in a static world. It requires the transmutation of our meanings, as well as retentiveness, to make counting possible. The formula, $n + 1$, cannot express the individual significance of the cumulative steps of number. The zero of subtraction in mathematics, as in $x - y = 0$, presupposes at least ideal destruction of possibilities; and so serves to symbolize the destruction of real alternatives in the choices of the volitional process. The concept of the infinite, again, would be impossible except for a thought activity which can abstract from its limitations and thus conceive itself, in obedience to a certain law or purpose, as creative of new steps, "world without end."

Thirdly, the incompatibility of our judgments and attitudes which claim to be of the same object and by the same subject; which concern reality at the same point in space and in the same respect, makes it necessary to suppose that reality at the same point is unstable, has a history; that our judgments vary, because they are made concerning a different reality, or by a different subject; that, in other words, we have different strata of transformations of being, at the same point, necessitating different judgments. Whether these transformations are in the real subject or in the real object, does not matter. Either or both may be the case. In either case new judgments of reality are necessitated; and we must find a way of making our judgments consistent, by assuming a new attribute of reality beside that of stuff.

Some judgments at any rate are relative though they claim to be true. This relativity, moreover, does not pertain to their function within their own context. We are taking for granted that they successfully lead to the object which they intend then and there. We will suppose at any rate that the Gauls are such and live in such places and in such social relations as Cæsar tells us. Why, then, should his description fail to fit the France of to-day? Why should not once true be always true? How can there be legitimately conflicting truths? We must account for the discrepancy of judgments, made with reference to the same point in space and in the same respect, without contradiction. We can have different judgments coexisting in regard to different points or different aspects; but how can we have different judgments on top of each other, as it were, and claiming the same point? This can only be because of a certain inherent principle of diversity or non-identity in the point so that there is transmutation of its being; or because a different subject is making judgments of the same identical point. We must introduce a non-spatial, non-stuff attribute, a pure dynamic principle, which shall necessitate incompatible judgments with regard to reality. Whether the difference is regarded primarily as creeping into the real object, or into the real subject, in either case, it means ultimately incompatible attitudes toward reality. All change resolves itself for knowledge into a change of point of view or new experience.

We can define, then, the relation of time to judgment: Time is that attribute of the real subject-object, which makes incompatible judgments (*i.e.* different judgments as regards the same aspect of reality at the same point) necessary.

This time character of reality appears nowhere more clearly than in our quantitative judgments of the time process. "Let us imagine a transcendental being, built upon the principles of the eternalist conception of reality, paying a visit to our empirical world and catching sight of a timepiece: 'Hello there,' he says, 'what is that?' On being told that this is an instrument to measure time with, he asks: 'Well, how much time is it?' He is told that it is one hour and thirty minutes. 'All right,' he says, 'one hour and thirty minutes.' 'No,' the terrestrial being says, 'it is now one hour and thirty minutes and thirty seconds.' In blank astonishment our visitor replies: 'You say it is one hour and thirty minutes, and you say it is one hour and thirty minutes and thirty seconds, which do you want me to believe?' 'No,' the terrestrial says, 'it is one hour and thirty-one minutes.' 'You are an incorrigible liar,' says the visitor. 'No,' says the terrestrial, 'look for yourself.' It is just one hour and thirty-two minutes.' By this time the language of the transcendental visitor is not such as ought to be heard by mortal man, and so we must close the interview." [1]

Such is the nature of time that no measurement of time can be absolute. For given any quantitative description of the flowing process in terms of hour, minute, and second, and the statement must be continually revised. If you make time a quantitative series, you must introduce a second series to measure the time of the measuring process, which itself is a time process. But in this way, your time concept would always leak. You would have to refer to another standard *ad infinitum;* you would never reach time. The judgments of time become infinite. An infinite number of serial perspectives are required, which merely means that time itself is not a series, but lies in another dimension from the world of description, yet conditions that world and furnishes the rationale of our attempts at serial construction. The reality of time is thus forced upon us by this instability of the universe, including the universe of truth. Change could not be produced, as modern science seems to imply, by the mere juxtaposition of static entities or substances. We need a negative property, as well as positive properties, to make change possible. We depend indeed upon the nature processes to do the work, we can merely arrange the conditions. But we must not suppose that the abstract conditions, which, taken alone, would remain eternal fixtures, exhaust the nature of process.

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[1] Quoted from "Time and Reality," pp. 23 and 24.

The question might still arise whether this conception of non-being should be called by the name of time, or whether that does not more properly belong to the Kantian conception. To this, I would answer that the above conception *is* implied as the fundamental aspect of time, both by common experience and science. By time, the unsophisticated at least do not mean merely the *measure* of time or the chronological series, but *passing* units or a *moving* series. And the *passing* or *moving* is more fundamental to the conception than the units or the series. Should the *procession* of years stop, we all recognize that time would be no more. When we speak of time, it is that time flies; time is on the wing; time slips away; time passes; time steals upon us; time creeps in, etc. The time concept cannot be exhausted in our static, timeless chronological picture. We must rather recognize this picture as conventional. We must identify time with the going on of process, instead of with the conventional measure of process — as "sticking in being" and making it unstable. Common experience is here saner than Aristotle and Kant.

There is no other way of defining time which is not circular. You cannot define time and leave time out. Define time as the number of motion, or the measure of time, as is done by Plato and Augustine (who conceive time to originate with the solar system), and you have the circle of using as definition a concept already involving time, for motion requires both time and space, beside mass for its definition. And there is no measure of motion, including the earth-clock, which is not relative to time. Identify time, again, with the order series of number, and, beside producing confusion of names, you find that number as successive acts, with cumulative meaning and novelty, already implies the time concept. The same will be true of any definition which treats of time as relative.

Time, however, is not change, but the condition of change. It is not necessary to suppose that time itself changes, though it makes our values unstable, creeps into our equations. The chains of necessity will not hold reality within the mechanical construction of our three dimensional geometrical space. Facts slip away, and creep in, which require another dimension.

Having once defined the real time character, we can easily account for the serial aspect of experience as expressed in the psychological series of past, present, and future. These do not, by their sum, constitute time. They are derivatives, on the contrary, ideal constructions or will-attitudes, necessitated by the relation of the time character of experience to the structure character, and remain to the end relative. The past is the attitude toward the content which time has negated and transformed, and which therefore can no longer as such be acted upon; the present is the sense of real activity, or the going on of process; the future is the expectancy, the prospective attitude toward the coming or new content, the field of real possibility. The irreversibility of the concrete past, on our theory, is not ideal merely, but is due to the real negating and transforming of the world of experience for which the present symbols stand.

While the irreversible character of process has generally been conceded, it has not always been made clear in what sense process is irreversible. It is clear that the nature of the process must be taken into account in order to define its irreversibility. The more complexly organized a process is, the more essentially irreversible it will be found to be. Thus simple processes, such as are found in the inorganic world, are practically reversible, so far as our crude averages are concerned. Indeed, reversibility is a postulate of the physical sciences. There is, however, a limitation even here, in that available energy is in part dissipated in every activity. There are difficulties, too, in the limitation of our control as in mending the broken china. When we deal with organic processes, irreversibility seems more of the real nature of the process. We cannot, with the means in our control, reverse the process from childhood to old age, and so death in multicellular structures at any rate remains for us an inevitable fact. In our social relations, there are various degrees of irreversibility. We may injure our friend, make restitution, and be forgiven. It is not true in such a case that the past is irrevocable in the sense that it cannot be altered. Not only can it be changed, but the result may even be heightened in value because of the correction of past errors, and the atonement for past mistakes. Mary Magdalene may be more of a saint for having been purified from seven devils. But whether the past is transformed for better or worse, history cannot be the same as though the past had not been. The past, moreover, may be in large part beyond repair, owing to our changing finite conditions. The friend we injured may be dead when we awake to repentance; and while a merciful humanity and a merciful God may give us another chance, as we feel that the latter will do, the objective injury so far as our limited view point goes, is irreparable. In any case, while the past is ever transformed in the course of the process — improved or deteriorated by being taken up into the context of the ongoing stream — the deed cannot be undone in the sense that it does not count. It conditions for better or worse the character of the transformation with its creative uniqueness. The advantage of the temporal view of the world is that it does not make us slaves of the past. New beginnings can be made. Melioration is possible. Not only can the future be better than the past, but the past itself may come to have new significance and value for being taken up into a more comprehensive future.

Our universe may be conceived as floating in time, as it does in space. But the character of time as opposed to space is to make a difference to contents. What difference it makes depends upon the organization of the contents. As there are relations which are extra-spatial, so there may be relations that are extra-temporal. It is not necessary to the belief in the reality of time to prove that all facts or relations must be subject to time. But admit time at all, in the smallest way, and it is impossible to reduce it to a function of a static system.

There may be truths or relations to which time is irrelevant. As there are certain relations, such as number relations, which are independent of space, so there may be certain formal relations which are independent of time. Time may be irrelevant to the formal relation, $2+2=4$, once the relation is discovered, however much it is implied in the genesis of our judgment. Whether any truths are actually thus timeless is a matter for experience to show and cannot be proved *a priori*. Even the law of contradiction is hypothetical, dependent upon the permanency of our mental constitution, though, of course, we cannot *conceive* a universe, without presupposing it.

Does the flow of the total time process have a definite form quality? Is it spiral or some other form? We cannot say by empirical induction. We can deal only with our piecemeal finite experience. History seems to indicate a sort of spiral periodicity of human experience; but even here the data are far too complex, and the span at our disposal too brief to make any definite generalization possible. Several independent variables must be taken account of in race evolution. We have no longer Hegel's confidence in the *a priori* construction of history. Some overlapping there is, some cumulation of meaning. Else history were in vain. But there does not seem to be a continuous process of development, as in the drama. New motives, whether due to race differences, to different traditional backgrounds, or to profound variations brought in by individual genius, serve to give history a new direction, and make it difficult to find a standard of comparison. Whether Greek or Gothic architecture is superior cannot be decided by any conventional measuring rod. Each is uniquely satisfying within its own temperamental and psychological setting. While in the case of our practical ideals, we would seem to be on surer ground, we must remember that here, too, the scale of values varies all the way from self-assertiveness to self-renunciation; and we can by no means be sure that our passion for doing things is superior to the peace which passeth understanding. Without any dogmatic theory about progress, it behooves us to profit by the past, and, so far as we are able, to enter into sympathetic communion with it.

Finally, it would be neither desirable nor possible to dissociate time completely from its secondary or phenomenal character, the chronological series. Language has once for all included this, just as we speak of the setting sun even after the Copernican theory. The conventional aspect of time has its convenience and relative truth, too.

CHAPTER XV

TIME AND THE PROBLEMATIC[1]

IN trying to meet the problems of life and conduct, we have found that we cannot deal with reality merely on the basis of our three dimensional spatial scheme of relations. We have meanings, somehow, which, while once truthful, cease to apply to the world as we find it. How shall we locate these perspectives of value which, though true in their own setting, no longer fit the perceptual world?

One thing is certain, we cannot take time as serial and still meet the demands of experience. We cannot conceive of time as serial without making both truth and reality impossible. Make time serial in character and you have this dilemma:

1. If you assume your time series to be real, then you have the coexistence of an indefinite number of real, exclusive moments claiming the same space, for each moment of time claims the whole of concrete perception with its dimensions. But reality cannot be both one and many in the same respect, hence reality becomes impossible.

2. But if the time series is regarded as ideal, then we have an indefinite number of descriptions or judgments, each exclusive of the other, and each referring to the same reality at the same point. Hence our descriptions or judgments claiming to be diverse, and yet of one reality, in the same respect, are contradictory, and truth becomes impossible.

The only possible solution, as we have already indicated, is to regard time as non-serial or prior to series, and to regard series as a derivative construction. Time must, somehow, be involved as a property of the real, conditioning the whole world of subjective construction.

If we take an historical illustration, the contradiction that confronts us is that we have many systems of ideas pretending to express the same fact. If we take Rome as our fact, we have many Rome systems which all assert their reality. Thus we have the Rome of Victor Emmanuel and the system of relations clustering about it. We have also the Rome of the Napoleonic era, the Rome sacked by the Vandals, the Rome where Cæsar was assassinated, the Rome of the Gracchi, etc. The peculiar thing about every one of these systems is that they all equally assert their own reality, every one is complete and exclusive of the others. Actually, however, the Rome of Victor Emmanuel is the only one that in 1916 A.D. corresponds to the perceptual content Rome, or can interact with the real moment of living interest; and so the others are excluded from existence. Furthermore, the present system of relations is complete, entirely apart from the other systems. The latter have nothing to do with international relations. They cannot be reached by gunpowder. They are, therefore, anomalies. They assert their reality, however; unlike the mermaids and centaurs they are entirely in agreement with the scientific canons of possibility; they really refer to the perceptual content, Rome, but fail to fit it. They all say, we are Rome, but only one system seems to be able to command present belief.

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[1] In this chapter I have drawn freely from "Time and Reality," Chapter V.

But the earlier systems which fail of perceptual verification in the now are the products of the same activity and the same tests as the system which now is valid. If there is no way of making the earlier systems consistent with the present, we must not only declare them false, but we must doubt the possibility of ideal systematization, that is, of truth, at all. We must, therefore, find some means of harmonizing our conflicting or duplicate ideal systems, if truth is to be possible; and if truth is not possible, then we must stop philosophizing. We cannot fall back on the absolute for truth. Truth means ideal harmony for us. Ideas do not transcend themselves; they are our leadings and must be harmonized within our experience. Nor can we fall back on immediate experience when thought fails. We cannot say that we have intuition, which is not present intuition, and so intuition of pastness or futurity; the contexts which symbolize the past must be intuited as figuring in our present experience. What shall we do then with the superfluous systems which have no real relations with the now?

It is evident that we must introduce a new factor to get over the contradiction.

What we actually do in our scheme of history is to arrange these systems with reference to the perceptual present and affirm them all true except for time. The systems are arranged teleologically, as nearly as we can, in an ideal series, time accounting for the conflicting reality claims. To know what the historic past and future are, becomes then easy, because we see that they are our constructions to account for experience, and that they have no reality except for our positing them as such explanations. As such, however, they point to some fundamental property, which must explain the present discrepancy.

Take, again, the case of motion — of Zeno's arrow. The discrepancy is the same as before. We have, once more, a number of systems of relations which all pretend to mean or express the nature of the same fact. These systems are all exclusive of each other. At any one point in space, and at any one moment in time, the system of relations of the arrow is complete; we have at that point and moment a whole universe, a perfect quantitative system of relations. At another point we have an equally complete, but a different system to express the same fact — the flight of the arrow. We have, therefore, in so far as the movement of the arrow furnishes us a line which is infinitely divisible, an infinite number of possible points and an infinite number of possible systems, all defining or pretending to define the same arrow. Furthermore, these universes coexist ideally, and all claim to be real; none, however, really expresses the flight of the arrow. The ideal systems, in so far as they pretend to express the meaning of the movement, are not only all contradictory, but all false, provided we cannot reconcile them in a new dimension. This is made possible by introducing time, a fact which does not as such appear in any system, but accounts for the possibility of the ideal coexistence of these systems. It is just this impossibility of getting along without time which has led some scientists, as Lagrange, to introduce it as a fourth dimension, though time itself is not a dimension of relations, but rather the *rationale* of a unique non-spatial dimension.

A New Dimension

The past is such an ideal dimension. Our serial construction of chronology exists nowhere except in our way of treating the facts. This is equally true of the spatial scheme of dimensions. The Cartesian coördinates exist only as our conceptual tools. Dimensions are ways in which we find it convenient to symbolize relations. In each case, however, there is a factual basis for our ideal construction. We no more make the character of the past, than we make our perceptual world in space, by taking account of it in terms of our purposes. In each case, we find it convenient to spread out our facts in a certain order in our attempt to orient ourselves to our world. We can make our world consistent and practically intelligible only by spreading out the past in a dimension of its own, independent of the world of space perception. While we may utilize spatial metaphors, such as the line, in symbolizing the past, it is based upon another set of values from space dimensions — values of succession and becoming, instead of coexistence and constancy. The dimension of the past is as much necessitated by the demands of experience as are the spatial dimensions of the present. In each case social agreement has abstracted from what is personal and unique in our individual perspectives and emphasized those features which are relevant to common understanding and action.

There are two things of which we must take account in order to understand the nature of the past. In the first place, the past has a non-being aspect, without which it could not mean past at all. The past world exists no longer as perceptual; it exists only as it has been taken up in the ongoing movement of history. The Greeks are no longer besieging Troy, Cæsar is no longer crossing the Rubicon, though those experiences are continuous in history with events and civilizations now real. The question arises, however, if the past world is a world of non-being as contrasted with present perception, why should we have even the ideal construction of such a world? How can we mean or refer to such a world at all?

This leads us to the second aspect. The reason that we can construct the past at all is that it involves, besides this qualification of non-being, contexts of content within the present that give us a basis for our past construction. The past is not a mere fiction. It is not for us to make history as we please. While the past has no independent existence of its own, it has a factual basis within the present which we cannot ignore. We reconstruct the past from present records. Perhaps I can make this clearer by an analogy. If we examine the geological strata, we find the basis within them of a certain series. There are, indeed, no past layers. All the strata are present strata; all the characteristics are now characteristics. Should the mountain become conscious of itself, however, it could construct a series of conditions, no longer existing, to account for its present character. A better illustration would be a tree. A tree has various layers or rings that enable us to tell something about the history of it. Suppose the tree should become self-conscious, it could construct a series of conditions to account for its present state; and, if it did construct such a series at all, it would have to construct it in a certain way, owing to its present character. Yet there are no past layers or rings. There is only the present tree as an organic unity, suffused with present sap, though the old layers retain a certain individuality of their own in the present structure.

So our reflective moment discovers within itself certain characteristics, certain survivals in the way of memory, as within the individual organism, or of records which are the survivals within the larger social processes. These make it possible to construct an order or series of attitudes, constituting history. The feeling of duration itself is a present feeling, however much it may help us in giving significance to the ideal construction of a past-series. If we choose to construct such a series, however, the present character of reality makes it necessary to recognize a certain kind of order, which has a real or factual basis within the present. Each successive moment in the series must be such as to supplant, to occupy the space of, and to exclude the reality of each preceding moment.

Moreover, such a construction is necessary in order to make the present reflective moment intelligible at all. If the birth and the funeral and all the intervening stages were thrown together in one promiscuous mass, experience would be a hopeless chaos. The individual attitudes or meanings, with which history deals, are exclusive of each other, each claims the whole universe for its own, fills the whole of space with its three dimensions. The point of view of the Homeric world, with its gods and heroes; the point of view of the age of Pericles with its art and its philosophy; the world of Cæsar with its conquests and its political ideals, each fills the universe with its presence, and does not recognize the reality of the other. In such a babel of tongues, a timeless view of the world would simply have to commit suicide by abandoning the law of contradiction altogether.

The confusion can be resolved, if we regard experience as making itself anew, if we regard the universe as essentially creative, at least in spots. To some extent, it accumulates past experience into present structure, as well as transforms present structure into new experience. Each moment of experience brings its sense of order with it, spreads its content out into its spatial and other ideal series. There is no inconsistency any longer in each point of view claiming the whole universe. Each individual meaning claims *its* universe. When the old meaning and its universe are taken account of by a new point of view in a new universe, the old point of view, in so far as it was valid, and the old universe which it meant, still are seen to fit each other, and no attempt is made to rob the old meaning of its universe.

Thus the present real self, "the heir of all the ages," finds it convenient to look upon itself as one out of a series of universes, which have been retransmuted and superseded, in order to understand its own constitution and define its own expectancies. This is true not only in regard to the spreading out of the past will-attitudes into history proper. The self also finds it convenient to spread out the world below the level of experience into an evolutionary series in order better to understand the present forms of being and their characteristics; and thus we have theories of biological and geological evolution and nebular hypotheses. Here we translate that which knows no internal meaning into meaning and history for our own convenience, on the basis of certain structural characteristics, as they exist for us.

Knowledge of the Present and the Past Contrasted

The present is the field of scientific observation and practical attitudes. Science deals with a now constitution of reality, on the basis of which we can link our facts and anticipate the behavior of things. To obtain such uniformities, science necessarily abstracts from the individual aspect of things, and selects out of reality the constant qualities and attitudes, convenient but only part of reality. Ethics, on the other hand, aims to deal with reality as concrete and individual. It deals with the adjustment of individuals to each other in social life, in which alone they can realize their needs.

There is a peculiar quality about the real relationships to the present social context of experience, which the symbolic past lacks — that of living response or reciprocity. We must recognize the other personal contexts, not merely as having their own meaning, but as capable of sympathetic participation with us. This has been strikingly brought out by Plato in the "Phædrus," where he discusses the advantages of living communication over written records. "Writing," Socrates is made to say, "is unfortunately like painting; for the creations of the painter have the attitude of life, and yet, if you ask them a question, they preserve a solemn silence. And the same may be said of speeches. You would imagine that they had intelligence, but if you want to know anything and put a question to one of them, the speaker always gives one unvarying answer. And when they have once been written down, they are tossed about anywhere among those who do and among those who do not understand them. And they have no reticences or proprieties toward different classes of persons; and, if they are unjustly assailed or abused, their parent is needed to protect his offspring, for they cannot protect themselves."

What is lacking, then, in these past minds, incarnated into the spiritual body of language or looking at us through the marble or painting? A meaning of their own they evidently possess, which we must respect and appreciate. They express definite attitudes. They have a purpose of their own. They are the soul in an individual act, the stereotyped expression of an individual insight, made eternal by being isolated from the stream of personal history. But while taken out of their personal history, they continue to figure as purposes and energies within social history. As part of the history of the social mind of a people, of a race or of humanity they continue to grow, to spread, to energize the life of the race. They retain their individuality within the great and ever-moving social constitution. What they have *lost* by being thus socialized and given an artificial body is their individual feeling of value. They are incapable of individual sympathy with our flesh-enveloped minds.

The dialectic of the past, in other words, is a one-sided affair. The living speaker develops his meaning of the past to his own satisfaction, and that is all that can be asked. Future moments may find the present meaning partial and unsatisfactory, but the real past itself makes no emotional response, says neither yes nor no, offers neither resistance nor encouragement. It is plastic, so far as value is concerned, in the hands of the present moment, a means to a present end, and yet does not complain, does not stand up for its own integrity, though such integrity it must have to figure as a present object of knowledge.

Not so with the individual moments, in the present social continuum of experience. Here you have a two-sided dialectic, a yes and no relation. Misconstrue the other mind and you fail of coöperation, fail to realize your purposes. The other reflective consciousness not only has a meaning, but insists that he means what he means, refuses to be the mere instrument to your end. If you would share his life and realize your own larger life, you must revise your meaning of his meaning so as to approximate more closely to the latter. You must respect his own sense of value. The more comprehensive and sympathetic your meaning, the greater your opportunities for life. Would you construe him simply in your own way, treat him as a mere thing, then you run up against it, you are slapped in the face, sometimes literally; whether you are successful or unsuccessful in this external dogmatism, you forfeit your chances for a larger life, you fail in the struggle. The only way you can succeed is by an acknowledgment of the demands which the other consciousness makes upon you.

Thus in the relationship of individuals within the present social continuum, conscious agreements become necessary. Each individual, to realize his demands, must learn to recognize the demands which are made upon him by other individuals. Only as there is a mutual recognition of such demands, do social institutions become possible. What beings we are forced to acknowledge as individuals, and the character of these individuals for us — this depends upon the demands to which we must adjust ourselves, which we must recognize in order to realize our purposes; and the adequacy of the realization of our purposes will depend upon the adequacy of our recognition of these demands. The closer the approximation of our meaning to the living purposes of other beings, the better we shall succeed in anticipating their behavior and in adjusting ourselves to our world. In the case of the infra-reflective nature processes, no acknowledgment of external meaning or value is necessary. To use these processes, therefore, as mere means calls for no protest, and the test of truth on this level is simply the success of such manipulation.

That there are different individuals, however, can never be proved *a priori*. *A priori* the ego never could get away from itself. It would simply have to create its own non-ego outright, and this would be no non-ego at all. A non-ego, which should exist simply as an act of our positing, would indeed be beautifully transparent and controllable, but it would be absolutely barren too, as far as satisfying any needs. It is only *a posteriori*, through sympathetic relations, or through our failure of adjustment, that we have come to recognize other individuals at all. It is through the *a posteriori* process of ideal construction and trial that we have learned to meet the non-ego in a more adequate way.

At best, our knowledge of other individual minds is a matter of approximation. We can only partially hope to get the real significance of a meaning beyond our own. Communication and conceptual definition are concerned with whether we aim at the same objects in each other's experience. It has to do with the generic features of our meanings, not with identity of fringe as regards such objects. Functional identity is all that is necessary for practical relations. The important thing is not whether our meanings are the same, but whether they terminate in similar behavior. If so, our meanings may be taken as equivalent.

Absolute sameness of meaning, at any one time, would mean absolute sameness of mental contexts or mere identity. If there are individual meanings at all, this will be impossible. And we must behave, at any rate, as if there were different individuals. The greater the sameness of conditions, however, the greater the sameness of meaning. Twins, it has been shown, manifest a great deal of likeness as regards tastes and preferences. But however closely alike the organic conditions may be, there is a difference in subjective conditions, difference in emphasis, difference in initiative and choices, difference in social setting.

The greater the disparity in conditions and meaning, the more difficult becomes the problem of agreement or common understanding even in the crudest ways. How difficult it is for us to interpret the child mind and to sympathize with its aims. We treat it just like a little grown person. How little sympathy we show with savage races and how little, if any, significance we attribute to their lives as shown in our treatment of them. Still more problematic becomes our knowledge in regard to animal consciousness. We are apt either to deny to the higher animals any significant life, or else to attribute to them our own consciousness. In the lowest organisms and in the inorganic realm, knowledge becomes a mere demand for external continuity and use, as far as we are concerned.

Even in the living present, then, and where the conditions are most favorable, our knowledge is decidedly problematic. The value of our knowledge, even on the highest level of development, must be estimated from the point of view of convenience for action and appreciation, rather than with reference to exhaustiveness.

In the meantime, since reality is individual, and because it is individual is dynamic, there is an element of non-being in our knowledge. Our ideal construction gives a value of its own to reality beyond. And as the reality beyond is ever changing, the prospect of exhausting the surd and reducing the universe to the dead level of sameness is at most a dream of those philosophers, in whom the passion for identity overmasters every other passion. Only in a world of abstract averages could such a permanent instinctive adjustment, as Spencer dreams of, be possible, surely not in a world of unstable individual equilibriums, with the possibility always of new insight as well as the possibility of going wrong. Each creative act, whether new purpose or sin, changes the total complexion of the universe and involves a fresh readjustment. In a world like ours, therefore, there will always be coexistent many experience moments with their different perspectives of history and nature, each with its scale of values. Sameness for us is, at best, a category of conceptual abstraction, to be used in so far as it may be convenient. Better live in a problematic and contingent world, however, with something to do and something to attain, than to suffer from the *langeweile* and dull monotony of a world where nothing happens.

The difficulty with the past, as we have seen, is that it makes no living response. We are dealing there with attitudes no longer actively real. As to the past attitudes themselves, we must rely on records, but the records are merely symbolic of past points of view. The thought universe, within which they lived, is at most only a partial world to us, a stage in the evolution of our own experience, while to them it was the whole world. The mythological world, for example, which was reality itself to our ancestors, is a mere shadow world to us, at best preparatory for better things. It was a belief world to them, it is mere fancy to us. We do not get the past attitudes or meanings *as such*, we get them only as transmuted and appropriated into the historic movements that have succeeded them. That is their significance for us. How plastic history is, is evident from the difference in emphasis and interpretation from age to age. Each age uses history for its own ends, reconstructs the past for the sake of its own purposes, and in obedience to its own needs. The more complex the point of view grows, the more hopeless is any realization of the real meaning of the primitive attitudes.

Sometimes there has been an attempt to regard the past as resolvable into mere degrees of complexity with reference to the present. This, as an artificial device, may, for certain purposes, be justifiable. It is convenient sometimes to regard the mind of the savage and the baby as our own mind simplified. Such meaning as we get out of the universe must naturally, as shown before, involve such a translation into terms of ourselves. But the savage and the child are not mere complications of content. They are wills, in their own right, with their own unique value. Here lies the difficulty of understanding them. Were they mere things, no such difficulty would exist. We could read their qualities in terms of other qualities, we could take them as mere instances of their kind. If you understand one piece of gold, you understand all pieces of gold. When it comes to wills, each will must be understood and appreciated as such, even though this can be done only in terms of our own experience.

However different may be the practical relations of sympathy and interaction as between the past and the present, the method of knowing the past does not differ from that of understanding the present. In either case, the procedure must be pragmatic — the trying out of our hypotheses or attitudes in individual and social experience. In either case, the difficulty lies in the uniqueness of the volitional context. The fact that the two wills exist ages apart does not itself alter the problem. I can more easily understand Plato and Aristotle than the children that play in the yard. In any case, we must draw upon our own experience; and in the case of the child, we must draw upon our memory so far as we can; we must strive to make real the past will of our own early life.

History must be regarded, then, as our ideal construction on the basis of past contexts of will as they survive in records. Its justification is a practical one. In appropriating the institutional or accumulated life of the race, we come to consciousness of ourselves, we come to understand *our* world, and to anticipate better its behavior, though the music and the discord of the past have been merged into the movement of the present. History, therefore, has a practical aim. We can act more intelligently in the present by taking account of the contexts of the past. The past dimension is convenient for spreading out certain present strata and observing their tendency for us. In order to have history at all, human, biological, or geological, we must abstract and simplify as best we can within our complex present; we must try to understand the motives of past human history in the light of our own present tendencies; we must breathe into the symbolic structures of the dead past such soul as seems to be called for by their greater simplicity or complexity. But we must not be deceived into mistaking our constructions for reality. These past symbolic structures, once at any rate, had a soul of their own. In the case of our own childhood points of view, moreover, while they are no longer real beliefs, we at least own them as once ours, and can contrast them with our present point of view as fading memory structures.

While we cannot make the contents of the past, the value of the past varies with the purposes of the living present. Hence the history of the past is never closed. For history, whether political or philosophical or scientific, is a process of evaluation, and the value of the past must ever vary with the changing purposes of humanity. What seem real values in one period of history, may seem illusions in another period. The intoxication of military pageant seems as barbarous to a scientific and industrial epoch as does the display of human scalps. Thus, entirely apart from the discovery of new facts, we see how the perspective of history assumes ever new values. It takes its coloring, chameleon like, from the context in which it is seen. The original values are difficult to reproduce at best as they are colored for us by the present background.

It is not always that the past values appear to us as illusions. Sometimes, indeed, they seem prophetic of the present. The past attitudes furnish the leading, so it seems, which terminates in the present. Here, too, we must be on our guard in reading our values into the past attitudes. Each age and sect claims the true Christianity, each national party claims to continue the true policies of Washington and Lincoln. While the real leading cannot here be over-estimated, we must none the less realize that we are looking at the past through the eyes of our age, and only in the long run, if at all, can the fairness of our interpretation be wholly proved. In the meantime, we must be modest and open-minded.

By virtue of individual creativeness, and the complexity of historic currents, with their unequal pace of development, the past values may appear not only as prophecies of the present; they may appear as standards of the present. Thus in art and philosophy we still look back to the Greeks as masters; and in ethics we find our ideal outlined by the old prophets and the Master of "the Sermon on the Mount." But whether we look from a higher to a lower level of appreciation, or from a lower to a higher, we are equally limited by the atmosphere of value which we carry with us.

In looking back at the historic series, as we have spread it out, it seems indeed to bear the stamp of necessity. But this necessity is merely subjective and *a posteriori*, and should not be read into the historic process. It means simply that we could not now take account of the facts in a different order, or with a different meaning. If we look into the making of history, we must not forget, however massive the accumulation of experience in the way of customs, language, and institutions may seem, that individuals built history, and that the social products are the result of their accumulated purposes and failures. In the making, as well as now in the interpretation, the facts were plastic. While the facts now fit in, and seem the natural outgrowth of their predecessors, other facts, had they happened, would have fitted in equally well by transforming their predecessors into terms of themselves. The facts themselves are gifts therefore, and it is for us to fit them together as best may suit our purposes for the time being. The only place where reality is determined or stereotyped, is in a stereotyped brain, in a mind that has substituted verbal counters for real meanings.

Knowledge of the Future — The A Priori and Probable

The future has no content of its own, such as the context of the past. What meaning it now has is present meaning. The past has a chronology which is binding upon us. We must respect the records of the past with their meaning. The future knows no records, it respects no data. The future as such, therefore, is pure ideal construction. While the socialized past has one dimension, and the present has three dimensions, — the future has no dimension of its own at all so far as actual content relations are concerned. It is the projection of the present with its observed sequences, qualities and relations into the non-being or emptiness of the future.

That does not mean, however, that we can make up the future out of the whole cloth of past and present. The future is bound up with the creative aspect of reality, particularly with the creative contexts of life and will. It is in part at least, and so far as concerns its concrete individuality, indeterminate. This can be best illustrated in our own development. The self grows, or at any rate changes, with the reaction. In its animal innocence of thought, it cannot predict the insight into good and evil which may come by eating of the tree of knowledge. While we must utilize past experience in meeting the prospective situation, the alternatives which we thus abstract from the situation are only instruments in the service of the concrete process which singles them out. Prediction concerns the abstract aspects of the facts at best. If reality did not consist of a series of unique dynamic situations, if we could predict *a priori* from the abstract elements or qualities precisely what the compound would be, if in short nothing really happened, we should have no problem of the future.

It is this creative character of our world which compels us to be empiricists, so far at any rate as the concrete facts are concerned. We must qualify all our formulæ by saying that in so far as the relevant conditions are the same, we may expect the same results. But it is only in the simpler physical processes at most that we can for practical purposes control the conditions. When we come to human volitions, the conditions are being complicated by each act. It is only in the abstract and on the average that we can have mathematical precision. Aristotle already pointed out the difficulty in making particular judgments in regard to the future: "It is indeed necessary that that which is should be *when it is*, and that which is not should not be *when it is not*, yet it is not necessary that everything which is should transpire, nor that everything which is not should not transpire; for it is not the same to say that everything necessarily is when it is and to assert in general that everything is necessarily."[1] To make a long story short, all necessity rests upon a certain constitution of the selected facts, and the necessity, therefore, is only guaranteed, in so far as the special constitution is guaranteed. Such guaranty in our world can only be pragmatic, *i.e.* for practical purposes certain processes can be taken as repeating themselves. We can, for the particular purpose, ignore the differences. We can ignore the fact that our friend has grown gray, so long as his loyalty remains. How often, however, we bank upon conditions being the same when they are not the same. You change or the friend changes and sympathy and fealty become impossible. Social conditions alter and the best old laws become impractical. In our plastic human world, at any rate, we must reckon with the uncertainty of the future. And of late we have come to look upon all our formulæ as thus pragmatic and limited to the abstract and observable aspects of the case.

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[1] "De Interpret.," 19a, 23ff. (translation by W. A. Heidel).

The only scientific basis for the future is our belief in the uniformity of nature, our faith that the present conditions are in a measure legislative for those to come. The future which science deals with is not the creative, individual future, but the present constitution of things extended into the unknown dimension of that which is not yet. The future, therefore, based as it is upon characteristics which have been abstracted from the individual character of reality, must always be hypothetical. Other things being equal, if our concepts hold, if the observed uniformities are real, such and such things will happen.

The indeterminist and the determinist have committed the same fallacy, so far as making one moment legislative for another. Each resolves the stream of experience into abstract motives and makes these play upon each other. The determinist, having abstracted certain characteristics on the basis of the past, insists that these must hold for the future. The indeterminist, too, places his confidence upon certain abstract considerations, which he emphasizes within the present, and insists that an act in the past might have been otherwise. He, too, neglects the time element. But if we use the consciousness of regret as the basis for the judgment that we might have acted otherwise, we must remember that the act itself has brought new insight and that the self, therefore, which judges the past is not wholly identical with the self which acted in the past.

What is practically important is that, with the experience gained, we *can* now do otherwise. If again we insist with the determinist that the act must have happened as it did, because in retrospect we must read it as consistent with such a past, we must remember that had the action happened otherwise, it would have been equally consistent with the past, since we are judging character by outcome. In each case, our concepts are the abstract leadings which enable us to a certain extent to control our conduct on the basis of our insight. Were there no leadings, social plans would be impossible. Were there no change, no future, we should have no plans.

There is no such thing as *pre*diction in any real sense. The *pre* should at any rate be left out. Science, in its ideal construction, abstracts from the time aspect and emphasizes only the structural aspect of reality. In treating of the physical processes, stereotyped as they are, we do seem to have a case of mere repetition. But it would be mere dogmatism to suppose that even here we have a real repetition. It may be simply repetition for us, with our gross system of averages. Scientific knowledge is only approximate, a convenience for our adjustment.

If we take account of our scientific attitudes, they surely are anything but stable. The so called laws and axioms of science are being retranslated all the while. The only identity here is the identity of mere symbols, not of meaning surely. The symbols, $2 + 2 = 4$, may be the same, but our whole conception of number has been revolutionized within a generation. The axioms of geometry, which seemed so absolute even to the British empiricists, have been sadly torn to pieces within recent times, and have received a new meaning altogether. The symbolic equations are the only thing that has been stable about the law of gravitation, and even these have been challenged of late as mere approximations. The conception of the law itself is in the crucible of criticism. The law of conservation of energy is no longer dogmatically asserted even by physicists. Lagrange grants that energy may disappear, and Maxwell that it may be increased through a sorting process. It is, however, an important working basis. In the light of history, therefore, it would be mere idiocy to suppose that our conceptual attitudes toward nature are stable.

When we consider knowledge which deals with the plastic world of meaning, here, at any rate, mere *a priori* dogmatism soon proves its own absurdity. The man who makes the social and individual future out of the whole cloth of the present; who regards his private attitudes as legislative for the process of history, is bound to bitter disappointment, or at least to be the laughing-stock of the future. The man who established the Dudlean lectureship at Harvard, in order that future ages might thunder forth their condemnation against "the damnable heresies of the Catholic church," would probably be as chagrined at the carrying out of the provisions of his will, as he is amusing to us. A man by the name of Paine who gave five thousand dollars, something over a hundred years ago, to establish a trade school in Boston a hundred years in the future, did not realize that the apprentice system would vanish out of our institutions before then, and that the courts of Massachusetts would have difficulty in translating his will into present purposes. Pessimistic theologians have mourned over the rejection of their religious concepts, their creeds of hell-fire, as Jonah mourned over his gourd, not realizing that it is more important that the universe should develop new meanings, than that it should be held in the death grip of their past concepts. The political reactionary is fearful of departing from the old order of things with its manipulation by the few, and smells danger in the arousal of a people's conscience and sense of fair play. In the language of F. P. Dunne, as regards a recent political convention: "'The throuble looks to be over makin' th' timpry organization permynint,' said Mr. Hennessy. 'That's all th' throuble in th' wu-rr-uld,' said Mr. Dooley. 'Me frind wud like to make th' timpry organization iv th' wu-r-uld permynint. He ought to. He's timpry chairman, chosen by th' comity.'"

There is indeed a certain continuity within the process. In the midst of our human flux, certain themes seem to be permanent; and in terms of them, we can judge the changing endeavors of the race. In the midst of the organic fluctuations and transmutations, certain types or directions seem to remain; in the midst of the indefinite variations of inorganic compounds certain qualities or elements can be traced as practically constant. Our perspective of the past, therefore, enables us to make certain disjunctions of probabilities as regards the future. At any rate, what happens in the future will not happen without relation to the present. The future will be better somehow for our seriousness, for our attempts at improvement, even though the particular gifts which the future may bring must be waited for. With our larger insight into the laws of process, we can at any rate improve the present, and so be ready for the future. The quality of the gifts which the future brings at each moment are conditioned upon the set of the will which conditions the future.

While we cannot anticipate that which is not created, while we cannot read off a meaning which can only come into being by a transformation of our present meaning, while it is always true that the present truth must die in order that the higher truth may come, still the present makes certain demands upon itself, which the present does not satisfy. It may be that the demands are wrong, it may be that experience will embody the demands in a new and larger meaning, but in either case, the present provides problems for the future, and furnishes a certain direction to the future.

To recognize that the present makes demands upon itself which it cannot satisfy, is a very different thing, however, from holding that we now anticipate the fulfilment of these demands, and compare our present meaning to a larger meaning. If so, knowledge would be complete now and eternally. We may realize that our hypotheses are inconsistent, and yet be limited to them. We do, indeed, believe that, somehow, knowledge will not stop here, that by creating new hypotheses and by fresh investigations there shall be a survival of the fittest which will mean a greater approximation to truth. But if we could anticipate that truth now, we would be foolish not to stop working. Whether right or wrong, we must make violence on the kingdom of heaven by striving to coerce reality to fulfil our demands or needs. Whether we succeed or fail, we shall gain experience, in the light of which our demands shall have new meaning. What is needed is an open mind to meet the future without bias or prejudice, and to act on the light as God gives us to see the light every moment of experience.

Nor must we be overconsistent. It may be necessary even in science, though its aim is a consistent system of truth, to hold to contradictory hypotheses for the time being, when such hypotheses are useful in dealing with the facts. It may be that the contradiction is involved in the nature of things. If so, we shall have system in so far as it is possible, and we shall be better able to anticipate the behavior of things. It may be, and we have a deep-rooted faith that this is so, that the contradiction is due to our own chaotic purposes. If so, such a measure of meaning as we can reach will be a necessary step for further progress. Passive indifference can only mean failure in any case.

It is a safe rule to stick to all those demands which seem essential for the largest life, whether we at present can reconcile them or not. For purposes of knowing it may be important to emphasize the unity and sameness and wholeness of things. For purposes of action, on the other hand, it may be important to take account of the diversity and individuality, the changing and incomplete character of things. For ethics, for example, the universe must be regarded as plastic, as amenable to human purposes, and to a certain extent indeterminate in character, if the individual life is to count for something. While what seems essential now, moreover, may not seem so in later stages of development, and while our beliefs are bound to have new meaning as we go on, yet our beliefs are good in so far as they now help us to live the richest possible life. The best religion and the best philosophy, for us at any rate, is that which grows out of our present demands, and meets our present needs. In so far as they do so comprehensively and truly, we may be sure that they will be taken up into a richer future.

It is well to keep in mind that knowledge does not exist for its own sake, but for the sake of action and appreciation. Philosophy may have a creative function, such as poetry and art have. If, by creating a certain kind of belief world, we can attain to a larger life than we otherwise could, why is not the creation of such a belief world a legitimate thing, even though it cannot be measured in terms of the prosaic standards of science? In the spiritual reality of individual and social life, creative faith must be regarded as one of the most important factors. Without this, events do indeed happen differently. With it, the broken sword can still win a glorious victory.

Our finite attitudes towards the universe are, at best, compromises. Sometimes, they are contradictory, and only the more useful for it. When the Presbyterians added to their confession of preordination a clause on individual freedom and responsibility, they laid themselves open to the charge of inconsistency; but perhaps it was the best they could do; and at any rate, they avowed openly what other religious creeds and philosophies imply. While consistency is important, our universe is too big for consistency, and we often have to hold to postulates and hypotheses that conflict, because we cannot afford to do without them. They serve our needs. Perhaps the thinking and research of ages may resolve them into a more comprehensive view. In the meantime, it behooves us to be modest; to be open minded; to allow fair play of opinions; and, while emphasizing what needs to be emphasized as we see it, to regard our results at best as decidedly provisional, — stepping stones, let us hope, to better things.

"It may be that the gulfs will wash us down,
It may be we shall reach the Happy Isles,
But something ere the end, some work of noble note may yet be done."[1]

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[1] Huxley-Tennyson.

PART V

FORM AND REALITY

CHAPTER XVI

The Identity of the Ideals

The thesis of this chapter is that the ideals of life, of truth and beauty and virtue, are identical as regards form or the demands which they set to the concrete will. The difference in our ideal activities lies, not in their form, but in the specific end in which human nature strives to embody the ideals, — the discovery of truth with its characteristic satisfaction, the creation and joy of beauty, and the making of a social character with its concomitant happiness. In short, the content, not the form, differentiates the ideals.

In dealing with ideals, as in dealing with other aspects of experience, we must remember that philosophy must limit itself to the overlapping problems. Philosophy cannot treat in detail all the various types of concrete social ideals. It must content itself by taking account of the large genera under which these ideals group themselves according as they have to do with thought, appreciation or volitional conduct.

I

There have been various efforts in the past both towards the unification and the differentiation of the ideals. But both types of effort have been largely futile from the failure to distinguish between the form and the content of ideal activity, between the ideal demands and their concrete embodiments. A word first about the attempts at identification. The kinship of ideals was felt by the ancient Hebrew psalmist in the striking invitation: "Oh, worship the Lord in the beauty of holiness." But we do not look for abstract analysis in this quarter. We are reminded of a similar poetic identification by Voltaire: "Only truth is beautiful, only virtue is lovable." We naturally look to the philosophers for systematic statement. Here, too, however, the identification will be found to be intuitional and fragmentary.

Plato shares with his Greek background the feeling that the good and true and beautiful are somehow one. In the "Protagoras" he strives to identify the virtues as knowledge, for it is knowledge that must furnish the measure in the evaluation of goods; and insight when present cannot fail to control conduct. Hence the problem of virtue becomes the problem of education. By implication all the values of life are here reduced to truth. In the "Symposium," beauty, with its intoxicating contemplation, becomes the supreme ideal. In the "Philebus" he identifies beauty and virtue in terms of their common denominator: "Measure and symmetry are beauty and virtue the world over." In the "Philebus" and the "Republic" he makes the good the final genus, including under it truth, virtue, and beauty. But these are merely brilliant intuitions,—looking now to the form, now to the content of the ideals for unity.

In modern times Shaftesbury has summarized for us the Greek point of view as regards this essential kinship of the ideals. "What is beautiful is harmonious and proportionable; what is harmonious and proportionable is true; and what is at once both beautiful and true is of consequence agreeable and good." But this statement too is impressionistic. It fails to divorce form and content; and as regards the latter fails to furnish the differentia. It amounts to only a *feeling* for the kinship of the ideals. It does not unravel the problem. The same Greek feeling is to be found in the poet Schiller, as regards the kinship of beauty and virtue, where, on the one hand, beauty refines us into virtue and, on the other, the virtuous life must be looked upon in its perfect stage as the beautiful soul. Lotze, in like manner, feels the kinship of truth and beauty. For him the ultimate self-evidence of the unity of truth "must no longer be called logical but æsthetic and accordingly will find the touchstone of its validity no longer in the unthinkableness, but in the plain absurdity of its contrary." And again: "The coherence of the many single elements of truth which enables them to be ranged under a simple fundamental idea may rest upon æsthetic propriety."[1] Here too the relation is a matter of intuition, not of clearness and distinctness.

My revered teacher, the late C. C. Everett, came back to the problem of identification again and again. Thus he tells us: "Goodness and beauty are really manifestations of truth."[1] Again: "The three ideas of the reason are simply manifestations of one and the same principle. The first affirms that which is, the second that which ought to be, while in the third we find that which is as it ought to be, the fulfilled perfection."[2] To this relation to the will I shall come back later, but what made Everett feel the kinship was the implication of unity in each ideal.

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[1] Lotze, "Logic" (Eng. Trans.), Vol. II, pp. 329–330.

Lately, there has been an attempt to identify the types of value from the biological point of view, sometimes in terms of adjustment and sometimes in terms of satisfaction. But apart from the adequacy of the method, this is after all only the statement of the genus. It still remains to state the differentia in each case, whether of adjustments or satisfactions. Of course this must be done in terms of concrete values. At any rate the fancied unification is only vagueness.

II

If the efforts at unification of ideals have been intuitional and confused, so have the efforts at differentiation. Thus it has been suggested that the æsthetic attitude differs from the scientific and moral in that the æsthetic is isolated and sufficient unto itself, while the other attitudes imply larger connections. But in no case can we isolate so as to cut off completely from the background of experience. This is the more of life, which our ideal abstraction is intended to make significant. In each case there must be the fringe, the suggestive value. Art is as meaningless as science, where the individual fails to bring the necessary equipment of experience. The object in any case is a focus of suggestion, an effort, not merely to suppress, but to control association in a definite direction. The suggestions, however, must grow out from the expressed relations, — the object, not from the mere label. They must be continuous with the object and germane to it, — intrinsic and not merely extrinsic, internal and not merely external to the theme. The savage and the child do not discover the beauty in the Angelus because they lack the background of experience to suggest its internal meaning.

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[1] "The Psychological Elements of Religious Faith," p. 148.
[2] *Ibid.*, 200.

Since our ideal strivings are meanings, they *must* in the nature of the case select and abstract such aspects as will make the rest significant. In a measure all idealization is isolation, emphasis. But they must suggest, too, the larger setting and unity. The whole is never the merely present even in art. We might define art, with more truth, as companionship with the universe, to which the selected aspect furnishes the friendly introduction. Not merely what is presented, but rather what we bring in the way of experience and demands, is what constitutes artistic creation and appreciation. The selected object is the focus, the nuclear constellation of content, which suggests the richness of concrete experience. All idealization is abstraction, but abstraction not for its own sake, but for the sake of making the concrete significant.

Since in each field the object is constituted by the selective interest, we cannot make this the differentia. In the case of each type of ideal realization, we must know the selective aim for the activity to have meaning. I saw little of merit in a painting before which I stood recently, until I read the subject, "Fleeting Shadows." And then it was marvelous. The artist had selected this aspect, the rest was foil. Lamb refused to admit that 2 × 2 = 4 until he knew what use was to be made of it. Whether true or not depends upon the selective aim. Of abstract quantities it is true, but not of human personalities. Whether a deed is morally significant or not depends upon the aim. If done from impulse, it is a mere natural event like the falling stone. If done from motive, it indicates a good or mean character. Thus all ideals tend in part to abstract, isolate, frame. But they also have their larger individual and cosmic setting.

It has been customary to credit moral activity with the aim of improvement as contrasted with other types of ideal activity. But it must be clear now that, in neither case, do we take experience as we find it. In each case must the immediate be reconstructed in conformity with our ideal demands. ,In each case must there be selection, emphasis, suppression of motley details in order to make experience significant. In neither case do we make the facts or data. We create by selection; we bring out the promising relations; we experiment to express in terms of the presented material what we deeply and truly mean as idealizing selves.

Another attempt at differentiation of ideals is based upon their relation to attention. The æsthetic ideal, for example, is held to be characterized by spontaneous attention, unconscious creativeness, the immediate absorption of the will, while the scientific and ethical ideals, especially the latter, are held to involve active and strenuous attention. Attention, however, does not furnish conclusive differentia. The moral life cannot be distinguished from the æsthetic by the sense of effort involved in the obedience to the moral law. We must be careful not to confuse points of view, — the point of view of the creative activity and that of the spectator of the result. The latter does not necessarily require effort in any case. As regards the former it may require effort in any ideal activity. Working by genius does not mean working without effort, even though genius is more than dint of hard work. Artists do not necessarily dash off the results which we sometimes find it so easy to appreciate. Spontaneous genius does not exist outside the story books. Few realize the painstaking toil that has entered into what seems to us so spontaneous and satisfying. The original of many a stylist seems fairly lost in the corrections which overlay it. The artist may have spoiled many pictures, with heartrending consciousness lest he should miss the gleam, before he gave us this masterly result. Nor is it an unmistakable sign of art that we should enjoy it immediately, — as it were, love it at first sight. The first impression in the world of art is not, any more than in the world of truth, necessarily most worth while. In either case, the immediate hazy intuition must be made clear and distinct by analysis of the idea of the author in its various moments. This eventually brings back the sense of unity greatly enhanced.

In the case of the moral life, on the other hand, active attention has been emphasized. But temptation and effort may indicate only a bad education. They are no test of the worth of conduct. The really moral life finds socialized conduct, the proper volitional response to a common life, largely automatic, —

a second nature controlling the primitive type. The sense of effort should be a transition stage to spontaneous obedience of the moral law. In any case idealized conduct means controlled or measured conduct, and this can only be had through training. At the beginning of the ideal life the gods set labor. Spontaneous mastery, absorbed attention in the ideal object, in the case of any ideal activity, logical, æsthetic, or moral, is the fruit of training and self-control. The feeling of effort indicates the novice. It has nothing to do with the worth of the activity. Some people could not give spontaneous attention to anything but rag time. That does not make them moral.

Each form of ideal activity has its ought, its sense of incompleteness, the command of the ideal, or, to use Professor Palmer's phrase, the command of the whole to the part. Beauty and truth as creative activities have their ought as well as the moral law, — their sense of failure, their feeling for potential wholeness, "which bids us neither sit nor stand but go" that we may attain the ideal. From life's larger point of view, at any rate, the poet, as well as the sick soul cowering before the categorical imperative, feels the discrepancy between what is and what ought to be. Hence the sense of fragmentariness, hence the effort at improvement. The ought characterizes all ideal realization in the process of becoming; and seldom, especially in the deeper genius, is the process complete. Tragic is the moment when he can say to his life's ideal: "*Verweile doch du bist so schön.*"

Sometimes, indeed, for a limited purpose, the consciousness of discrepancy between attainment and ideals scarcely enters into the particular judgment. Sometimes a particular truth seems to come as a flash of intuition, the brief lyric pours into a final mold in an ecstatic birth of beauty, the good deed comes with a sense of enthusiasm and self-surrender instead of effort. Each viewed in its isolation seems final and satisfying. But such cases are exceptions, and, even so, are the gift of a previous set of the mind, subconsciously incubated in the meantime. Goethe's "Faust" required a lifetime of labor to produce and takes as long to appreciate.

As regards *results* to life as a whole, here too no sharp line can be drawn. It is no detraction from beauty that it has results on our larger activity. On the contrary, it inevitably has such results and must be judged in a measure by them. Art has no license to violate our other ideal demands. It must be true to science in dealing with an actual world. It cannot make its own anatomy or space perspective. It must be estimated in scientific terms, even though it is not science. So likewise must it be considered with reference to the larger race life. It has subserved and still subserves a use in race survival. As the grown man's play it has its important place in the economy of human life. To be beautiful an object must be idealized, *i.e.* liberated from the sensuous. Its suggestion must be *ideal* suggestion. Thus it purifies. The same can be said of truth. Truth has its results, its larger setting in life. While it may not be pursued for its use, it has its use in making life more efficient. While it is not morality, it is a noble pursuit and gives dignity and calm to the soul. Nor is the moral ideal to be judged merely by effects. It is sometimes, notably in its highest instances, tragically out of accord with its temporary environment. Sometimes it is permanently impracticable, though nevertheless noble and inspiring. Extreme other-worldliness, "love your enemies," mystical union, etc., may never become practical types, but nevertheless they furnish noble reliefs and corrective viewpoints to our work-a-day, prudential world.

If again we try to differentiate the ideals from the point of view of *development*, we must be consistent. We must be careful to take them from the same standpoint. If we look at them as ideal results or in retrospect, they of course cannot develop. The past as such does not change. The hypothesis of Thales, whether true or mistaken, marks a mile post in science. The emancipation proclamation taken as a deed remains what it is. It may be evaluated as a historic event independent of the agent. So with the art work. Schubert's "Unfinished Symphony" is as finished as it is going to be.

If we take the creative point of view, the particular results become moments in a life history. Hypotheses are steps in discovery, deeds are the marking places in the progressive realization of will, each successive work unfolds the larger motives and possibilities of the artist. Each Madonna of Raphael gives not only the spectator, but the artist an additional insight into his idealized conception of womanhood; and in the series we can see improvement, clearer consciousness of aim. Finished results, — absolutely finished, — are but an illusion from the creative point of view, a testimony to our limitations.

If you look again at ideal striving with reference to the *plasticity* of its world, it would seem at first glance as though we had struck a profound difference. Truth seems to most people to deal with a rigid, predetermined constitution, given outright, while in ethics, in a strenuous way, and in æsthetics, in perhaps a genial way, we must somehow and to some extent alter the world to fit our ideals. The contrast, I think, is more superficial than real. Truth, so far as it is our activity, is a genuinely creative process. If there is an absolute truth, our efforts must indeed seem feeble copies to an omniscient spectator. But we have no first-hand knowledge of an absolute truth any more than we have an intuition of absolute beauty. So far as our finite experience is concerned, we create truth, — as we create institutions and art, — to meet our needs. In neither case do we proceed independent of experience. We must select out of its richness the significant aspects. In neither case do we make the laws arbitrarily, but rather discover their implications in our nature and in the nature of the universe. In the last analysis, in either case, we may be imitating an absolute mind, but that does not alter our finite problem. The realm of truth is as plastic in the hands of the potter as the world of beauty. The seemingly more rigid character of the former is due to taking truth in retrospect instead of in prospect, as made rather than in the making.

The contrasts which we have examined have been made so striking by taking ideal activities from different points of view, — the point of view of the spectator being contrasted with that of the producer, the part-point of view with the whole-point of view, the point of view of effort with the point of view of mastery, the point of view of the internal meaning with the point of view of the external relations. We can look at any of our ideal activities from these and other points of view. We can, for example, look at beauty from the point of view of creative activity or from the point of view of the spectator or assimilator. So in the case of truth or virtue. We can look at separate results, — separate concepts, separate deeds, or separate pictures, — or we can regard them from the point of view of a self-realizing process of truth, beauty, and virtue. In any case we must be careful, in comparing the ideals, to adopt the same point of view for each comparison, — to compare development with development, creative activity with creative activity, finished product with finished product, etc. The confusing of points of view led to the failure of the above comparisons.

So long as we regard our ideal activities from the same point of view, we find that what we can say of one ideal in the way of formal characterization we can always say of the others. There may be pedagogical convenience in setting the ideals over against each other for certain purposes. But the difference finally does not lie in the form, but in the content. In our survey we have seen how some have emphasized the abstract character of truth as wholly abstract. Some have emphasized the selective character of art as complete isolation. Some have emphasized the infinite demand of the moral law and contrasted it with the finitude of our other ideals. But these are not fair contrasts. They are not made from the same point of view. The abstractions of truth must be made, as must the selections of art and virtue, in the service of attaining a larger insight into the concreteness of life, not for the sake of abstraction. Art, like truth and virtue, only isolates for clearness and distinctness. The seeming isolation of the frame, — of the specific science, of the particular art work, of the particular life conduct, — merges in its depths into the cosmic background and can be understood only with reference to this. The object as framed in the focus of attention serves but to suggest a vague sentiment or "recollection" of the constitution of the universe which makes certain ideal demands upon itself through us and in which the sharp outlines of our abstraction fade into the moving, continuous woof of reality. The larger part of the meaning is always in the fringe. And if the ideal, as in the case of moral striving, appears as an infinite imperative, this is no less true of our other ideal demands in so far as we dwell upon the prospective, creative side and measure the felt potentialities of human nature in terms of its finite attainment. We must strive to bring clearness and distinctness not only into the ideal object, but we must bring such clearness and distinctness into the relations of the ideals themselves, and thus rescue them from the confusion of mixed view-points.

III

Having laid down the thesis that the ideals, as abstract or formal, are identical in all our striving for evaluation, we must now try to make clear what these ideals are. It will be seen on scrutiny that our ideal activity implies four demands which the object must meet. They may be stated as unity, harmony, simplicity, and universality. In the first place there must be *unity*. The various parts of the situation must be capable of being understood in terms of one idea, they must follow from a common principle or purpose which they are seen to embody. This can be shown in scientific synthesis, whether inductive or deductive. A generalization is never a mere collection or summary of particulars. The mere cinematographic registration of facts in repetitive memory does not constitute truth. The sequence of rain and sunshine, weddings and divorces, births and funerals is a meaningless show unless we can read the sequence in terms of a universal. Events, in order to be science, must be seen to follow from an hypothesis, and the hypothesis from the events. They must, for our pragmatic purposes at least, embody an idea or tendency. Bodies must not merely fall, but they must be predictable in terms of a mathematical law; life must not merely present a riotous sequence of change, but there must be within it a tendency to change in definite ways. There must be overlapping, the unity of a universal.

The same is true in art. What we must first discover in the object of beauty is the idea expressed in the details, the universal embodied in the diversity of parts. This universal may not lie at the surface. You must live in the presence of the Sistine Madonna, you must be willing to give serious study to Hamlet, to grasp the significant unity. Else the Sistine painting is a collection of more or less pleasing figures, Hamlet a series of more or less interesting episodes. You can't go to sleep over the great masterpieces any more than over the great scientific hypotheses and grasp their significance. You must enter into the creative idea of the artist.

What is true of science and art is likewise true of virtue. The virtuous life is not a series of episodes, — of more or less beneficent impulsive acts. Such a life is non-moral. You must find the meaning, the motive, the idea to be realized in the multitude of events and choices. They must be strung on a universal in the light of which they can be interpreted. If you are taking account of life as a spectator, you must put yourself at the actor's point of view, or as nearly so as your human limitations permit. Not only through the ages, but through the acts of each individual will with which you strive to sympathize, there must run a purpose. The shallow excuse: "I did not mean it," is an attempt to place oneself outside of moral responsibility. When it is clear that a deed follows from no principle, we not only individually, but legally, abandon the ethical criterion of good or bad. We see then that the first demand upon ideal activity, whether taken from the agent's or the spectator's point of view, is the discovery of an idea or universal in the variety of facts.

In the second place, in all ideal activity there must be *harmony*, — the parts must support or reënforce each other within a whole. Take it first in the realm of science: Facts must lean on ideas, and ideas on facts. There must be fluency of transitions or adjustments. There must be not merely evidence, but organized disjunctive evidence, where the parts supplement and reënforce each other. And the evidence must be adequate. It must be proportional in complexity to the idea which it aims to support. We cannot rest a momentous hypothesis on slender evidence and feel security or ease in the relation, any more than we can rest an immense edifice on slender pillars and have our will satisfied with the result.

Harmony in science means not merely organization within one hypothesis, but it means also that hypothesis must support and reënforce hypothesis within the overlapping fields of experience. Species must supplement each other, as well as individual lean upon individual within the larger kind which we strive to define. Harmony, organization, is therefore of the very nature of scientific system. One negative instance, one outstanding fact which fails to support the rest within the scope of the idea, destroys the idea's claim to express the facts of the kind and challenges to a new idea.

In art the importance of harmony is even more obvious. It is not enough that each part bears the imprint of the idea, like a heap of stamped bricks, but they must mutually reënforce the idea. In Guido Reni's Aurora every part testifies to the glory of the coming day. But more than that, each part helps to reënforce the idea. Movement, brilliancy, color, beauty of form, contrast, — all coöperate and converge to fasten the attention to the idea of nature's oft-repeated wonder. In dramatic opera the human voice, the instrumental music, the scenic setting, the acting, — all combine to reënforce the idea of the composer. Let any one be false, and the harmony is marred.

That harmony is essential to the moral life has been emphasized both by common speech and by the philosopher. The moral life is the balanced life, the rounded life, the life in which each tendency of human nature plays its proper part, each event receives its proper emphasis. Even with unity of motive a life can easily be marred by wrong emphasis, by making the trivial into the focal and the important into the by-play. The virtuous life is the life which gives each interest and moment its due. It is a just life. What harmony in each case — logical, æsthetic, and moral — emphasizes is that each part has a claim which must be recognized; and in turn that no part may stand by itself. It *has* a claim, but it is a claim within a whole. The parts must support the principal idea; but this they can do only when the idea is adequate to incorporate the parts.

Again, all ideal activity demands *simplicity* or *economy*. The ideal tolerates nothing superfluous. It is jealous of its rights to express itself. Sometimes the characteristic of simplicity has been emphasized as all-sufficient to define ideal activity. Truth is simple, beauty is simple, virtue is simple. So they are. But simplicity alone does not define these attitudes. In the first place, simplicity is meaningless until you specify your type of unity. It expresses the negative rather than the positive side of ideal selection. Again, simplicity does not necessarily mean agreement or harmony within the unity. We must not read the parts out of court, as has so often been done, for the sake of simplicity. Parmenides did so and left nothing but empty being, — neither true, nor beautiful, nor virtuous. Simplicity is only one ideal demand and must be pursued in harmony with the other demands.

In science, the demand for simplicity means that entities or hypotheses must not be multiplied. The simplest hypothesis which will meet the facts is regarded as scientifically true. Our theories must be molded upon reality as we must take it in our experience. While the more complex Ptolemaic astronomy might be made to meet the facts by cumbrous additions, we believe that the simpler Copernican system comes nearer expressing the real stellar relations. We must reduce our theory to the fewest principles which will meet the situation.

In art, as in science, simplicity is a fundamental demand, but here too simplicity must vary with the idea to be expressed. Hamlet cannot be expressed in as simple terms as the clown. The idea must have adequate complexity. Where, however, the inferior artist betrays his lack of genius is in the superfluous details, the obscuring promiscuity. No wonder art has seemed the mere removal of the superfluous, the chiseling away of the extraneous marble. This point of view, however, forgets that marbles do not come veined with Apollos and Venuses and that simplicity itself is meaningless except with reference to the selective idea.

In the moral life, too, simplicity is important. There must be directness of aim, the suppression of irrelevant detail, emphasis of the essential. How many a life loses itself in the mere multitude of busy episodes. The great life differs from the small in its simplicity, as the novel differs from gossip. Here again simplicity is not the only demand. Mephistopheles is more simple than Faust. We must judge life by its type of unity and the adequacy of this unity to harmonize the claims of life. There may be over-specialization as well as too much complexity. The idea alone can decide what details to suppress, what tendencies to emphasize.

Finally, all ideal activity implies *universality* in the sense of social objectivity. This does not mean a consensus of all.

It means that those with adequate development and training should be able to share with the agent the ideal object. Ideal activity cannot terminate in mere private states of consciousness. This again can be seen in all the varieties of content which the ideal may take. First of all, there can be no private truth. The processes of truth must be capable of verification by other observers. Else we have mythology, hallucination, error. Science is primarily a social institution, the outgrowth of our common mental constitution and common situations. Neither can beauty be private. It may require development and culture on the part of the spectators. But if no one but one should ever find an object beautiful, we would probably regard him as having a queer taste. Art, too, is a social institution, our common joy in creative activity and its results. It must define common situations. The social character of the ideal becomes still more striking in the case of the moral life. We may overlook an individual's erroneous thinking, we may laugh at his outlandish taste, but we cannot neglect his anti-social conduct. Our ethical judgments are through and through social judgments, — the balancing of claims from the standpoint of their fitness for a common life. True, the immediate social environment may prove wrong. It may give the hemlock to Socrates and crucify Jesus. But to some social environment our conduct must seem valid and fruitful, if we are at length to be pronounced moral. Only the immoral man claims an ethics of his own, and he only as an exception for himself, not for others. Even the fruits of vice could not be enjoyed in an anti-social world.

We have seen so far how in each mode of ideal activity the ideal is identical. It is the content that individuates. We have examined in turn the four characteristics of the ideal and their application to the different ideal activities. The question may be raised: Cannot these characteristics be still more simplified? This has been attempted in the past. I shall note only one such possibility, and that is the reduction of our ideal categories to the demand for clearness and distinctness. Descartes made this the final criterion of truth. It has been suggested by Hildebrand as the final criterion of art. I believe that such a reduction is impossible if we give this criterion the subjective significance which Descartes attached to it. We must reduce it to its "cash value," in terms of the relations which we discover within the content that embodies the idea. What people *feel* to be clear and distinct is as various as their tastes; and so long as we place the criterion on a subjective basis, we can have no standardization. In fact a criterion which needs to be standardized, as Descartes tried to standardize clearness and distinctness by an appeal to a God who would not deceive, is hardly a criterion. If, on the other hand, we give clearness and distinctness a pragmatic significance, it will be found to imply all the ideal characteristics already stated. Pragmatically, it becomes the clear and distinct expression of an idea in its selected content, or the clarifying of the content in terms of the idea. Such clear and distinct expression must have unity within the parts. The idea must include the facts, or the facts must fall within the idea. There must be organization or the mutual support of the parts. There must be no irrelevant details. There must be social objectivity. Just because the idea is thus pragmatically clear and distinct, it must compel the social approval of the competent.

IV

If ideals are differentiated by their matter and not by their form, we must cast a passing glance at the content of the ideals. From the point of view of content, we may take human nature in its three classic modes as cognitive, as appreciative, and as volitional, bearing in mind that ideals have no application at all until human nature attains the complexity of being consciously selective. Ideal demands, when applied to the relation of ideas to perceptions and to other ideas, become the quest for science. To attain fluency, harmony, simplicity, and universality as regards the agreement of the idea with the constitution which it intends is ideal realization in the realm of knowing. But we have an affective nature, too, and objects must be measured not merely in terms of their existence, but in terms of their value. To make objects fluent, harmonious, clear and distinct, and universal, so far as our human appreciative nature is concerned, constitutes ideal realization in the realm of appreciation. Lastly, our volitional claims must be measured in terms of other volitional claims in individual and social history. To fulfill the ideal demands of fluency, harmony, simplicity, and universality in the realm of our volitional conduct, constitutes ideal realization in terms of virtue.

We would have, then, as our criterion the clearness and distinctness of the idea as expressed in the selected object, — the object of thought, the object of feeling, the object of voluntary conduct. When the clearness and distinctness pertains to agreement with a selected constitution, we have truth; when it pertains to appreciation, we have art; when it pertains to the evaluation of will, we have morality. In either case the idea must be adequate, it must be economic, it must leave no outstanding details. The difference is not in the ideal, but in the process or object selected.

It is evident that, of the three, the last overlaps, in a vital way, the other aspects of our nature. Indeed it is impossible except for abstract purposes to treat human nature as divided into compartments. The ideational activity would be but a pale ghost except as floating in the affective and volitional background. In turn, beauty must have meaning, and so involves the ideational side. All creative activity finally must have its spring in the will and its tendencies. If ideals are identical in their form, they also overlap in their matter. They must blend in the unity of the one life.

I have tried to show that our ideal activities are identical as regards their form, the ideal demands to be realized. By this insistence I do not mean to ignore the fact that the ideal, as *realized* in the different modes of human nature, differentiates into unique species. Science, art, and morality are different in the concrete, as truly as they are identical in the abstract. They constitute specific embodiments of the will. When we seek truth we do not seek beauty as our aim, when we seek beauty we do not seek morality. Satisfactions they all are; and as such they are all included in the good, as Plato pointed out long ago. But they are different species of the good. Each works within a certain type of material or instrument, through which it realizes its function in making clear and distinct the end. The matter or instrument of science is conceptual relations; the matter of art is concrete imagination; the matter of ethics is impulse. Each sets itself certain limitations, respects the nature of its material. The ideal, in the case of truth seeking, sets itself the limitation of agreement with a selected constitution, abstract or concrete. That our will sometimes figures as a creative factor in this constitution, that it sometimes *makes* ideas come true, does not alter the necessity for our cognitive nature to take account of the facts as made, of discovering the laws in the sequence. While human nature must make ideal demands upon the universe to have truth, it can only succeed provided that the universe lends itself to such idealization. We cannot legislate arbitrarily to nature. We must try to discover clearness and distinctness *within* the relations of nature. That success here is possible is due to the fact that reason is not an arbitrary addition to nature, but that reason grows up in the soil of nature, is nature's reflection upon itself.

In beauty the aim is not the breaking up and systematizing of reality for the discovery of its constitution, but for the sake of social and constant objects of enjoyment, — the joy in activity and contemplation on the part of the developing, historic will. This producing of agreement between nature and our affective-emotional human nature is a different value or satisfaction from that which our search for truth yields. Here too, however, nature and human nature must conspire. As parts of the evolution of nature, we are such and nature is such, that we can discern relations and objects which furnish permanent and spontaneous joy in the play of our faculties. We are made for the sunset as much as the sunset is made for us.

Finally, the ethical end in the concrete is the harmonious adjustment of the individual to the historic social will, — the discovery of right or justice in the measure of volitional claims. Here, too, life or nature lends itself to such adjustments of claims. Our ideal demands are found to be practical and, in the progressive realization of the meaning of life, the only practical ways of social conduct. Nature again conspires with human nature.

While the concrete values or ways of realization are different for thought, feeling, and character; while they lead to unique satisfaction of the will, they must support and supplement each other, and, because subjected to the same ideal demands, they must fundamentally and ultimately agree with each other. That is, the truth must, without surrendering its specific character as true, also be found beautiful and noble; and so with the other ideal values. "Human nature in its progressive realization can be seen to be fundamentally one, and the realization of the true must be seen to be fundamentally bound up with the right and the beautiful, and all to be species of the good of the entire self, though this does not prevent us from recognizing certain differentia in this ultimate good. The good in the concrete means proper functioning on the part of human nature in its various relations, the harmonious activity of all its capacities, fluency of life, consistency of transitions. The right means fluency of functioning as regards human individuals in their institutional relations, the proportional equalization of claims. The beautiful means the harmonious and complete expression of our ideal demands in terms of our affective nature, the feeling of fitness and support as regards the various parts of the æsthetic object. Truth means the fluent termination of the clear and distinct idea in its intended facts. In the equilibrated life of the individual as a whole, all human nature, — cognitive, emotional, and volitional, — must function with ease and fluency of transition without any conflict of the activity for the true with the realization of the beautiful or the right. They are nevertheless *specific* forms of the good; and, in our imperfect finite development there may be provisional discord." [1] In the meantime, while the conflict is partial and halting, the unity on the formal side is clear and eternal.

It is clear that, in idealizing human nature as an individual whole, the same ideal demands hold as in the case of the specific types of realization. Here, too, there must be unity, harmony, simplicity, and universality. An ultimate ideal must be found comprehensive enough to include all of our human tendencies. Further, the parts must harmonize or reënforce each other. The part-ideals must work together so as to supplement and interpenetrate within the whole of life. Here, too, there must be simplification and universality. Within life in its wholeness there can be no conflict of reason.

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[1] "Truth and Reality," pp. 238, 239.

Such wholeness, however, we fail to find within our finite human realization. And as our nature must be loyal to such a wholeness or perfection and cannot rest in the provisional and partial realization, the religious consciousness, the conception and worship of God, must eke out our finite limitations. In our religious loyalty we feel that our ideals are concretely realized. Religion adds no new values to those already mentioned. But it adds the sense of completeness, of unification, and of conservation to our finite ideal strivings. The identity of the abstract form is here exchanged for the unique unity of an individual life, in which form and content are fully blended, where the unity of the ideal purpose embraces all the facts, where the parts all support each other, where there is clearness and distinctness of relationships of parts, and where all mere subjectivity disappears in the organized whole. This final unity of concrete interpenetration is at the other end from the abstract formal ideals which we have considered.

The end of life is to transcend finality, in the sense of abstract ideals with their sense of obligation, and to reach spontaneity, — unity of form and content, perfect activity. In a perfect being the ideals interpenetrate each other as they clothe themselves in a matter no longer foreign to themselves, but their idealized and transfigured embodiment. This living unity we worship as God.

CHAPTER XVII

FORM AND THE OUGHT

The Nature of Form

WE have seen in an earlier chapter[1] that all our generalizations presuppose three fundamental characteristics, viz. variables, recurrence, and form: It must be possible to analyze out, within the flux of reality, certain distinctive qualities or entities; these must be generic, *i.e.* they must recur in various individual situations, and in various moments of time; and, lastly, they must be capable of being formulated in terms of a few simple principles, — the object with which we deal must have a definite "architecture." This applies to all our generalizations, whether of pure mathematics, or of physics, or of social relations.

Now, it is a notable fact that while we have recognized the importance of the characteristics of variables and recurrence, the characteristic of form has often been treated as accidental. It has seemed somehow as though the form were added to the constitution of reality by our minds. Our mind is so constituted as to read order into the universe. It looks for resemblances and groups things under laws and kinds. It stamps its anthropomorphic ideals and purposes upon its world. So impatient is it of chaos and diversity, that it takes short cuts. It becomes dogmatic about its superficial analogies and formulæ, and treats them as absolute. Further investigation, however, discloses new diversities and complexities. The old formulæ are seen to be crude approximations. The cry is for a first-hand acquaintance with things. The old generalizations are condemned as fictions, which in a great measure they have been. Sometimes, the human mind has become skeptical as to the possibility of ever discovering any objective order, such skepticism being always in proportion to the previous dogmatism. Moreover, with our human limitations, the subjective element is likely ever to be prominent, and the critical spirit is apt to find again and again that what we had taken for the architecture of reality is in fact the artificial creation of our immature will-to-believe. Under such circumstances, the interest in the individual variables comes to loom large; and nominalism for the time supplants realism. Objective form is for us at any rate, as Plato saw, a limit in the flux of human opinion.

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[1] See Chapter III.

It is only fair, however, to point out that our knowledge of the diversity and generality of the structure of our world is no more final than our appreciation of its form. The three must proceed *pari passu.* We discover the diversity when we attempt to sort it into kinds; and we cannot know about either except as we try to define them, or formulate them into propositions and æsthetic structures. We cannot derive the generality from the diversity, or the form from either. The question is what diversity or generality is *significant,* — makes clear and distinct the problem in question. The principle of economy cannot be deduced from mere happenings whether recurrent or otherwise. That we shall combine the predicates of reality in certain ways to establish order and meaning is a fact of another dimension from their mere chance existence.

It would seem to the unbiased mind that the aspect of form has the same basis in the nature of things as have the discriminations of individual occurrences and their resemblances. We do not *make* the laws of falling bodies, or chemical proportions, or the natural series of elements, or the unity of the organism, or the consistency of the argument, or the harmony of the art work when we discover them. In so far as our formulations really work, we must regard them as the architecture of the world which we strive to know, and not merely as the architecture of our mind. It seems reasonable that the untiring search of our mind for order, faulty and stumbling though it is in execution, is somehow a reflex of the world of which mind is the conscious expression. As Santayana puts it: "It is no part of the essence of numbers to be congenial to me; but it has perhaps become part of my genius to have affinity to them, simply because nature of which I am a part, and to which all ideas must refer to be relevant to my destiny, happens to have mathematical form."[1] As our primitive instincts are recognized to be responses to fundamental characteristics and demands of our environment, so we must recognize that our higher instincts which have to do with form, with order and beauty, are indeed orientations to the universe of which we are a part. They are, in the Platonic sense, "recollections" of the constitution which interpenetrates human nature as well as nature and of which we become conscious under the stress of social dialectic. As the flatfish imitates through its eyes the geometrical pattern of the bottom upon which it rests, not knowing what it is doing, so the mind, through a long process of trial and error, comes to imitate the formal constitution of the universe. For the most part, its adaptation, too, is blind groping with relative approximation. Only as it rises to reflective consciousness, can it begin to bring into clearness and distinctness the higher laws of its being. And even then, it must be largely prejudiced by the fact that it must judge the great world through the peculiar limitations in which its pattern reveals itself in human experience.

From the fact, however, that the laws of thought are implied in our mental constitution, and have been forced upon it in its adjustments to the objective world, we have at any rate a presumption that the laws of thought are the laws of things. This presumption comes to be further verified through thought's success in dealing with its world in its hypothetical procedure. Reason is not an accident, but has come to pass, and is successful, because the world is somehow congenial to it. The pragmatic procedure must judge by fruits, and if ideals are outcomes of the human experiment to meet its world, they must have a basis in the nature of reality. An abstract analysis which emphasizes elements, and neglects the organizing relations, gives us bricks without mortar, and fails to restore the structure which it has torn to pieces.

There have indeed been true realists in the past who have recognized the importance of form — your Plato and Aristotle, your Spinoza and Leibniz. The difficulty that we meet is that they have not been clear as to the nature of form. There has been especially a tendency to confuse form with the concept of activity. Even Plato, the first to appreciate the reality and significance of form, sometimes labors under this confusion. In the "Sophist," he makes his Ideas forces in order to guarantee their efficacy which, no doubt, seemed hazy enough to his contemporaries. As imitated by our purposive will, form, no doubt, comes to have efficacy, since organized effort, whether individual or social, is more effective and economic than unorganized; but as pure form, it can have no more efficacy than other abstractions.

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[1] "Winds of Doctrine," p. 120.

The poverty of Aristotle's ultimate concepts leads to the same difficulty. Aristotle's two ultimate concepts are matter and form. But matter, by hypothesis, is a purely passive principle, hence form must be the active principle in order to account for motion. It is true that Aristotle is by no means consistent in the use of these concepts. Matter sometimes seems to be endowed with a certain refractoriness or inertia. The active principle, again, is sometimes treated in a mechanical fashion as moving the world by push. But in the last analysis, hazy though his statement is, it seems to be form which exercises an attractive influence upon matter — the higher stages of form upon the lower, and pure form upon the process as a whole. Upon one thing, however, Aristotle is clear, and that is that form is not produced by the process, but legislates to the process. Hence evolution is not a one way process, from formlessness to form, as Herbert Spencer would have us believe; but form in all the varying themes and movements of cosmic evolution is always equally real.

Aristotle's difficulty shows itself not only in his concept of evolution, but in his concept of definition. A thing must be defined through its functions. Hence the functions constitute the form of the thing. But since the functions are an indefinite number, we never could have definition on this basis. Rather form consists in the selection of such functions as are *relevant*, as will make the thing or class clear and distinct. It has to do somehow with economy and simplicity, not with the endless variety of the perceived world. Here the advantage appears of distinguishing between the concept of energy, with its indefinite number of variables, and the concept of form. Form has to do, not with transformation, but with *formulation* — with the possibility of defining our situations in the terms of clear and distinct principles. We have seen that the simpler and more stereotyped kinds of reality, such as are dealt with in mechanics, have the advantage in simplicity; but the tendency towards clear and distinct types is present in the more complex stages of reality, too, — in the world of life and mind, with their creative transmutations. The bias of the human mind for such clearness and distinctness must be regarded as a cosmic fact.

Spinoza is a striking example of the confusion of form with activity. When he is not speaking as a physicist or psychologist, but treating of reality from an ethical and metaphysical point of view, activity becomes identical with clear and distinct ideas. Now it cannot be disputed that activity becomes *valuable* in proportion as it is organized activity, with a clear and distinct direction. It is thus, that it becomes formulable and understandable. But it is not the clearness and distinctness which produce the activity. They have to do with another attribute of reality.

Leibniz has, in the main, copied Aristotle and his ambiguities. The monads develop by their inherent form, but they also seem to be stimulated to do so by the existence of a hierarchy of monads, having for its poles, confused unconscious perception as the lower limit, and the clear and distinct self-consciousness of God as the upper limit. Leibniz, however, sometimes drops into the mystic conception of the perfect monad as creating the lower monads by some sort of emanation from itself. What is most significant, however, in Leibniz for our purpose, is the principle of sufficient reason which generically expressed amounts to a demand for reasonableness or logical coherence in our world, so that its motley variety can somehow be stated in terms of clear and distinct principles or defining relations. In this, we have, indeed, the essence of form.

What the formal constitution of the universe determines is not the endless variety of changes, fluctuations, and mutations. These are due in part to the internal, in part to the external conditions of the energies of our world. What is formally predetermined is a certain clearness and distinctness, a certain definiteness of type required of the fluctuations that appear, if they are to survive. This demand for clearness and distinctness comes to consciousness in our mental organization. But it must also be conceived as characteristic of the constitution of the cosmos itself of which mind is a part. Only so can it be relevant and successful. Nature works like an artist. While we cannot predetermine the particular attempts at art, we know that only those attempts can survive as art which are clear and distinct.

Powerless indeed is this form to create its special content. It cannot work *in vacuo*. The grist must be furnished by process. This may be the free acts of willing subjects; or, lower down, chance variations, of the inwardness of which we are ignorant. Nor can the form arrest the flux, nor annihilate its space conditions; but, within the process, it can determine that what shall survive must have worth, the particular richness or coloring being due to the process within which the form selects. The universe indeed becomes other for our earnestness or frivolity, our strenuousness or laziness. But this, at least, is true: that what survives must be in line with the direction of the process. The tragedy, moreover, lies not only in willfully missing the good, but in intending the good, and because of ignorance of the complexity of life and of the future, doing the evil; the well-meaning man having to proclaim in the tragedy he has wrought: "Das ist nicht was ich meinte."

Form is nothing, measured in terms of the world of sense-stuff, with its content and uniformities. Yet it is infinitely more valuable than the world of stuff. It can be no less real than energy, for it determines its meaning and direction. It cannot work independently of the finite, but in the transmutations of that which is, it asserts its supremacy. It determines the survival of the structures of stuff and ideals. For our ideals are structures striving to reflect or embody eternally the infinite direction. But their eternity is only in the intention; their content is relative.

Form is eternal. Since form is not stuff, mind-stuff or any other stuff, it is not subject to time and process. Only stuff is transmutable. Having no content, not being itself stuff, form itself is not subject to transformation. The formal constitution which sets the limit of process is not itself process, because then it would be relative and cease to furnish the direction for the protean variations of evolution. It remains constant in the flux. Thus we are forced to contrast, with Plato and Aristotle, the world of stuff and process with the world of form. The universe does not indeed become pure form; the logical dualism remains; but pure form sets the final survival conditions of process. The highest ethical and religious type is not cold form, but energy molded into form, and form expressed in energy — the perfect life.

It has been supposed by some that in order to insure the eternity and reality of form, we must have a static universe. This is due to confused thinking. To have truth and worth in the universe it is not necessary to be "stoppers of the universe." But it is necessary that the process shall be in some way selective. As in the dark, all cows are gray, so in a flux without direction there can be no valid distinction of values. So far from its being true that only a static universe guarantees worth, ideals can have no meaning in a static world. In such a world, everything is, as it were, dumped together, and error and evil, in so far as they exist, have as much claim as truth and goodness. Ideals can have meaning only in a selective process. Even the ideal of uniformity can have meaning, as Poincaré has shown, only in a universe of flux. For it exists in the service of prediction, and what prediction could there be in a stillborn world? Flux on the one hand, and selective direction eliminating what is contrary to it on the other, — these seem to be the necessary postulates in our world.

With Heraclitus we may affirm that this direction is "the divine which feeds all human laws." It is "the common" in the sense that it is valid for all and binding upon all, as opposed to the many who live "as if they had a wisdom of their own." It is not the common in the sense of the identical in the many opinions, but as the limit in the historic process. What is common to the savage and the civilized man, to the fool and the wise man, would be pretty thin and meaningless. On the contrary, form manifests itself in the concrete process of history, in the real flux, which is not merely a rearranging of bits of substance or mathematical models. It is no doubt true that the common in the sense of the institutional heritage of the race is, on the whole, the safest guide of life. Institutionality is the result of workability for the time being. But if the direction were merely the common, history would be a mere dead level without movement or progress. Its flashes of light must come first of all through the individual.

It is the ὅδος, "the path," of process and survival; but not in the sense Heraclitus meant it, — an upward and downward path, from fire down to water and earth and up again, "fixed measures" being exchanged, — a merely circular process in which nothing really happens. Not so with the real time process, where all uniformity or stuff is relative and absolute permanency is merely an ideal limit. In the protean guises of the process, form legislates. And while it cannot stop the process, it determines what can have meaning and existence in the process. It is not the projection of the ideals of the individual or of the race at any time. Nor do they intentionally point to it. They point to their own realization except as they qualify themselves: Not my will, but the eternal Ought, the objective demand for form, be done; and in so far they are contentless. The pointing or direction lies in the destiny "which shapes our ends, rough hew them how we will," not fatalistically, but by eliminating those free acts or accidental variations which do not fit its direction. The formal constitution of the universe, like the voice of Socrates, speaks only in the negative. Its content is ever changing and ever new. It is the direction of history: and yet for us it is ever born afresh out of the process it determines. It has no concrete being except as it is thus embodied in the fleeting moments. It thus furnishes "the way" in the trackless void of the future, as it is continually incarnated into the finite. It throws the golden light of ideals ahead; and yet at every moment it is a new, because finite light, with a new color and radiance, always, however, determined by the same form.

Form is creative, but it creates not by production, but by elimination. It is creative as the artist is creative, *i.e.* by selection. It is superior to "essence," as Plato would say, *i.e.*

to concrete truth and beauty as historic products, because it determines their worth and survival. It gives beauty to the perishing things of earth. It is both the "heavenly pattern" and the artist. It is a real or ontological factor of the world.

It is quite evident that Plato in the Republic and Symposium did not mean Idea in the sense of meaning or concept, because it is higher than dialectic — presupposed by all thought and worth in the concrete. Plato's insistence upon the reality of the Idea remains of eternal significance, though this must not be confused with the existential class concepts nor with forces, as Plato himself and his successors sometimes did. What Plato failed to see is that the Idea can only create in a flux world and has no other content but the flux. It is indeed an abstraction, but not a mere ideal abstraction. It intersects the concrete world of process. Only thus could it give significance to process. If Plato could only have made use of the conception of struggle and evolution (already dimly outlined by Heraclitus), then the world of flux and the Idea of the Good could both have been accorded their due reality. He would not have had to confess failure as he does in the Parmenides.

If we cannot give any definite content to the conception of absolute direction; if it remains for us merely the demand for law and worth; if, to use Plato's metaphor, we cannot look upon the sun itself, what is its child, its phenomenal manifestation? What evidence for its existence in the finite, structural world do we have? As we have developed the sense of extensity with complex instinctive coördinations to meet the reality of space; as we have developed the sense of duration with complex structural adjustments for measuring the flight of time process; as we have developed the feeling of effort to symbolize energy, so we have developed the feeling for form with its tendencies and sentiments, and its sanctions in social institutions, to meet the demands of the universe upon us. That, in the nature of things, just because the process is infinite, and because our ideals are part of the process, our ideals must be finite, does not invalidate the evidence of the *feeling for ideals* so important for the race. That, moreover, these sentiments and ideals are growing more essential and more adequate to meet the requirements of life must strengthen the faith in their objective reference.

The process of discovery must, in the case of form, as in the case of other aspects of our world, be provisional and tentative. It must come through the growing insight of the individual as he strives honestly to master his data. It appears in experience first of all as a personal gift. In this lies the tragedy of progress. The new insight runs counter to the customs and thoughts and habits of the mass. The self-preservative instinct of society rises against it; and the bearers of the new insight suffer accordingly in the transition and may be sacrificed in the readjustment. But by its intrinsic superiority, its simplicity, and reasonableness, real insight must eventually conquer prejudice. A new plateau is established in social evolution. This, in turn, is broken through by new stimuli from within or from without the consolidated group; and the equilibrium of custom is again disturbed, until a new adjustment can take place. While the human mass always retards the creative individuals, and while it is in the first instance impressed by the externals of prestige and power rather than by merit, the new insight must in the end prove a revelation of our own deeper nature, of our own formal constitution.

This is, indeed, as Kant maintained, the categorical imperative. It commands unconditionally. It does not grow out of our inclinations and impulses, but it determines the worth of these. Its sublimity surpasses the starry heavens, for the whole cosmic process is subject to it. In its consciousness we rise to meaning and freedom. We are part of another world to which the stuff world is subject. It is not the good will, but it determines whether wills are good or not. But just because it is an absolute limit; because all our finite ideals are relative to it; because it is the *rationale* of history and not its product, therefore no specific content can be given to it. The maxim of universality and all other maxims are but relative to it. We can only characterize it in the most general terms, and those, too, are finite. It means orderliness and comprehensiveness in the regulation of individual as well as social life. It is the law that there shall be law. Perhaps that is the safest determination we can give, in terms of reason, of that which transcends and determines reason. Its concrete content must come, in every age, from its finite setting in human institutional and individual experience. Thus we are able to meet our concrete duties in our generation.

The ideal must become concrete for us, as Kant saw, by being realized in a kingdom of ends. This is not so simple as Kant thought. For Kant, every individual is a little god or absolute, legislating for all men and the universe at large. But, on the one hand, the individual historic will is not autonomous, it must accommodate itself to the institutional life of the race; and the two may clash. Human beings, even when they think themselves most rational, do not legislate in the same way, and life must proceed by compromises. On the other hand, the institutional heritage is not final. The individual may be wiser than the institution. But both are subject to the eternal direction of the process; this alone is an absolute categorical imperative.

Like the First Mover of Aristotle, form does not itself move; but unlike Aristotle's "final cause," it is not the cause of movement, but it determines by its existence the direction and worth of the historic process, and thus accounts for progress. It is not only transcendent, but ever immanent as part of the constitution of the finite, *i.e.* it is the meaning we discover in the finite, but more besides. Else the finite would have no significance. Only thus could the yearning in the finite for the complete and whole originate. In being thus incarnated ever anew into human lives and the order of history, it can say with the Christ: "Lo, I am with you always, even unto the end of the world." It is the Spirit of Truth which guides and shall guide us in all truth.

This conception agrees with the Thomistic as against the Scotist position. It holds that God himself is determined by the norms of goodness and truth, rather than that these norms are the arbitrary result of God's willing. God on this theory would become the concrete, finite, and individual embodiment of form. We cannot discover ideals from what God wills. If it were possible for God to make ideals by arbitrarily willing them, we should have to have some Hermes to bring them down; and even then, they would be merely arbitrary, not binding intrinsically. It is through our ideals, on the contrary, that we come to piece out the concept of God, — not as the arbitrary lawmaker, but as the fulfillment of these formal conditions of human nature and nature. This fulfillment is a dynamic or growing fulfillment, — growing in complexity, creative of higher levels of realization, without invalidating the formal constitution which simply demands to be fulfilled. This fulfillment does not exclude but implies time. It makes, however, our values transcend time just in so far as the ideal is fulfilled. Its fulfillment, even in aspects, means eternal value.

With Hegel, we must agree that history has cumulative meaning. This holds, however, in the long run, and not always in the sense that chronological and logical unity coincide. History is a real process, not merely a system of logic, a scaffolding of categories. It cannot, therefore, be read off simply by logical implication. History is real happening with real tragedy and real success. It might have a different content, and thus must be studied empirically. What the form determines, is that what survives in the cumulative transformations and chances of history must have worth.

With Fichte, we must agree that the universe has a transcendental constitution. But this constitution is not merely a transcendental system of knowledge, a *Wissenschaftslehre*, not even Fichte's, which he thinks our free wills reject to their own damnation. The universe is not merely an ethical system, but an ethical process. That which is "overindividual," is the direction of this process; and we are not merely view-points within a system, but real actors determining the content, and so the character of the world. How we will, or fail to will, makes a difference to what the ethical process as a whole can realize, and not merely to our individual significance or suicide.

The ethical process cannot be like the Buddhist *Karma*, for if life is simply the causal result of what precedes, there can be no attainment of an ideal; there can be neither good nor bad, but simply the automatic record of the cumulative process. Life in that case must remain imprisoned in the iron grasp of the past. No, causality itself must be relative. There must be some fluency in the process. But most important of all, the criterion must not be simply a product of the past, but an independent attribute in order that it may pass upon causality and flux alike. The *Karma* permits of no salvation; no waking up from the evil nightmare. The horrible dream must go on.

Validity and Form

The most fundamental dichotomy of our ultimate attitudes to the universe is that based upon the reality of form. The theories in regard to the stuff of the universe may be academic merely. Pragmatically, metaphysical materialism and metaphysical idealism may have identical outcomes. Democritus and Priestly found room for the same objective values as Plato and Fichte. The practical potentialities of their worlds were the same. It is different with the contrast of formal materialism and formal idealism. While formal idealism holds that form is somehow inherent in reality, formal materialism holds to the attitude of brute chance. For the latter all relations are external relations. In the theoretical realm this means that there is no valid reading of events. There is only expediency. In the practical realm it means that *might makes right* whether in personal or group relations. Nor must we confuse formal materialism with the concept of scientific mechanism. The latter is a purely provisional attitude for a special purpose. It does not, or should not, claim to be a final philosophy. It is, as a matter of fact, an unconscious mathematical idealism. For formal materialism, meaning and value are accidental. Ideals are somehow a poetic fiction, a momentary addition to our world without intrinsic connection therewith. The events of the universe have no direction. They simply *happen*. And the sequence is determined in every case by the external accidents of the situation. Formal idealism, on the other hand, holds that ideal realization is not foreign to reality, but in some way grows out of its inner developing nature. It insists that there must be another and more inclusive dimension of reality than that of mere natural sequence.

True, materialism has always insisted that such a dimension is superfluous. But materialism makes far too great demands on our credulity: Reason grafted on chaos by chance variation, ideals superimposed upon the fortuitous play of atoms by accident, and this the truth, the absolute truth about it! Far saner seems to me the attitude expressed by Plato in the *Meno:* "That we shall be better and braver and less helpless if we think we ought to inquire, than we should have been if we indulged in the idle fancy that there was no use in knowing and no use in searching after what we know not; that is a theme upon which I am ready to fight, in word and deed, to the utmost of my power." For must not the assumption that truth is an accident prove suicidal to materialism itself, in so far as it aims to be a philosophy? Metaphysical materialism, as much as idealism, is founded upon a faith in form. Democritus, no less than Plato, assumes that the world is amenable to reason, though for the former the real truth is atoms and the void, for the latter the Idea of the Good. We must somehow provide for value and significance in our world. Else why philosophize? If truth is an accident, if the flux of things has no direction, then truth and error, virtue and vice are the same, and it becomes as absurd to speak of a materialistic philosophy as of any other kind. The same accident that makes ideals can unmake them. I cannot conceive of truth as even an ideal limit in such a world. A sane cosmic theory, whatever metaphysical stuff it may assume, must admit that under certain conditions the universe awakens to the significance of truth and beauty, to the recognition of form and meaning. For such are the facts, whatever be the stuff of things.

Without an objective form or direction, I do not see how validity can have any meaning. Such form is implied in our beliefs in validity and worth. It is confirmed by the very necessity, — the practical, as well as theoretical imperativeness, — of these beliefs. Since Augustine, it is a commonplace that we cannot argue truth or worth without assuming form. What if some one denies the possibility of validity? In such a case, all argument must stop. One opinion is no truer than another. Such a skeptic cannot criticize our argument, our logic or science. For by his own mouth, he stands convicted that there is no false argument. If we confine him in an insane asylum, he cannot argue that we are unreasonable, however brutally he may resist, even as a lion may resist confinement. He cannot blame our conduct in so doing. For on his own premises there is no right conduct, except what prevails; and we must be right if we prevail. He may insist that there is no beauty, but he cannot criticize us for regarding him as a bore, if we do have the feeling that he is a bore.

Any theory of the universe, on the other hand, which distinguishes degrees of validity, which holds that one state of conciousness may be better or truer than another, implicitly refers to a standard, a measure more comprehensive than each individual's momentary feeling or view-point. To deny this is to land in the contradictory implication of a standard more absolute than all, unless indeed we carry our skepticism to the extent of denying the validity of our skepticism and so commit intellectual suicide. We may lay it down then that all evaluation, skeptical or believing, implies a standard, transcending the immediate moment and socially valid. But the question remains: How must we conceive this standard? I see only two possibilities: We may assume with the absolute idealist a complete all-comprehensive, eternal experience. In this we must even now be sharers. We must move according to its logical necessity; we must unravel its logical categories; in the consciousness of its completeness, we must realize our finite fragmentariness. I agree with Royce and his master, the divine Plato, that there can be no ideal of relativity. In a world where there is no other standard than that which seems to any consciousness for the moment, any dog-faced baboon or tadpole would have as valid a claim as would the wisest of men. The possibility of error does imply an objective constitution. But an absolute and inclusive experience I do not feel compelled to assume. For me it is neither a logical necessity, nor does it answer my religious demands. If the universe is thus complete and perfect, it is difficult to see how our consciousness of fragmentariness and evil could ever arise. As the necessities of our existence call for adjustment to a world in which change and plurality with all their darkness play an important part, it is difficult to see of what practical use such a perspicuous hypothesis can be.

If we take the universe, on the other hand, at its face value and acknowledge it for what it is, — a stream of processes with its novelty, failure and tragedy, — then we must conceive the standard in another manner. As this standard is not constituted by experience, individual or social; as it cannot be regarded as an accidental product of the process, and yet cannot be merely external to the process, we must seek it in a form inherent in the process. If the process has a formal direction, dictating, not what can arise, but what can survive within the process, then the significance of the process as a whole, reflective or non-reflective, is guaranteed. And while we cannot read off an absolute truth when we do not have it, we have in this formal constitution a limit which transcends our finite moments, and furnishes the possibility of evaluating our finite degrees of truth and worth. The limit, as concretely posited by us, partakes, indeed, of the finitude of our positing; but the consciousness of this limit, however it may vary in content with human experience, becomes a corrective none the less for our comparison. And on the reality of the limit must depend in the end all validity, however relative, of truth and worth.

It is evident, therefore, that the concept of validity has a real basis only in a world which has form. If the process of the universe is merely a chance affair, no ideals can be enforced, or be binding whether mechanical or ethical. Science in such a world would have no guaranty for its ideals of simplicity and unity any more than ethics for its ideals of worth. What keeps warm the passion for science is that in spite of the complexity of the world, growing ever more apparent in the course of new discoveries, the facts can be more and more sorted under common principles; the Chinese puzzle of a world does seem to indicate that some parts belong together, and the faith in spite of failure ever springs up afresh in the truth seeker's breast that the rest will yield to the same ideals.

Radical empiricism is impossible as an ultimate philosophy. It is true, as the radical empiricist has argued, that in such a world one postulate is as valid as another, — the ethical postulate is as valid as the epistemological. But this is merely an *argumentum ad hominem*. On radical empiricism no ideal could be valid. Such a theory must derive the form from the variables, order from chance, validity from arbitrary agreement or from the fiat of individual will. But if validity is *made*, is a matter of convention merely, what objective coërciveness can it exercise, what standard can it furnish for the permanency of values? The difficulty is not altered by selecting the race as the unit. Certain values prove permanent and necessary — not because the race has willed them — but because when the race in any of its members does will them or feel them, they prove themselves intrinsically superior or higher; they set conditions of survival to the race because of the social unity and coöperation thus made possible. Because the formal conditions *exist*, therefore it becomes advantageous to discover them, — though they are, indeed, already implied in the yearnings and aspirations which are a part of our nature. There can be no *made-to-order* validity. This would be accidental, and not universal. It could not give us the concept of progress, the limit of finality.

Suppose we try to conceive our universe as without form. This is already a contradiction, for in such a world there could be no conception, no law, no meaning. To conceive is precisely to discover form. Such a chaos must in so far as we can include it in thought at all, be a limit derived from the relative absence of form, from the relative chaos of values, which we approximate in our inferior universes of conduct and appreciation. We can spread these out in a regressive series, and so reach as a limit the concept of formlessness. Could such a formless universe exist at all? It is not our business to make universes, but to try to discover the laws implied in the constitution of the world as experienced. Certain it is, we cannot think such a universe as existent. Our mind is shaped for a universe of order. But while we cannot conceive a formless world as existent, form and flux are logically separable. Some lives are more formless than others, some attempts at thinking and appreciation more chaotic than others. Ideals do fail of realization for the time being — perhaps some always. Great personalities are crucified, great artistic creation goes unnoticed, and is forgotten. This does not, however, invalidate the reality of ideals; and they prove themselves when they become part of the current of experience again. They may be eternal, even though existentially they do not for the time being prevail. Even though they are forgotten for a time, they still have worth. They may prove survival conditions in the sense that life or evolution fails because it does not grasp them, fails through its relative formlessness. To have value, as well as to be survival conditions, they must be appreciated and thus willingly or purposefully conformed to. In the life of a perfect being, the survival conditions thus become intrinsic. A perfect being has life in himself, he is intrinsically eternal. And not only this, but he can spread, or bring to birth in others, the consciousness of form, and thus create worth in others.

Whether the time process has always been conscious of direction is not the question. This, while genetically interesting, has nothing to do with the reality of direction. We have not always been conscious of space and time, and other characteristics of reality, but they have, none the less, conditioned behavior until we have acquired the tools for recognizing them. So direction must have existed before the consciousness of it, to give significance to process when we come to reflect; and for that matter, to bring about reflection. For why should we raise the question of form? If there was a time when reality was conscious of no meaning, it must at least have had a definite direction toward reason. The process must shoot into reflection by a law or tendency which reflection in retrospect can see to be inherent in the nature of the process, and not as a result of mere chance. Otherwise reason loses all validity as well as efficacy, and the mechanical ideal becomes merged with the rest in the general chaos.

If it is the limit of an absolute direction that gives meaning to our finite and fleeting oughts, to our relative ideals, must not the limit, then, be as real as the terms it limits? The straight line is surely as real as the varying curvatures of which it is the limit. I am speaking here of reality, not of worth. The straight line is worth more, or is more significant, than the multitudinous curves, but that is not the question here. If we grant the reality of our finite purposes, must we not grant also the reality of the limit which conditions their significance; which prevents their being swamped in absolute relativity or brute chance? Must not direction, without which process is unintelligible, be as real as the process? If it is helpful, moreover, to suppose that there is somehow in the universe such an ideal limit which regulates worth and survival; if even cosmic and biological evolution seem to involve such a direction to be intelligible; if, when it becomes conscious of itself in man, it can make significant and legislate to facts and impulses; if truth itself is more than an accident, and it is not a deception that there can be approximation toward a whole of truth, goodness and beauty, then this limit cannot be merely our fiction, but must be involved in the constitution of the process.

I cannot see how the pragmatic conception of truth can get along with less than this concept of absolute direction. If it implies that process is amenable to purposes and can be guided by purposes, that the test of ideals is their workableness, it must somehow account for the presence and place of purpose in the process. That the process is through and through reflective is a violation of the pragmatic principle itself, for there are surely some facts which we need not and cannot recognize as purposive. We seem, therefore, to be in a dilemma: Either we must accept materialism, that ideals are accidents and have no efficacy in the process; or we must hold with absolute idealism that there is no process, but that the universe is one complete whole, the purpose eternally fulfilled. In the former case, truth becomes merely an illusion. In the latter, truth becomes inaccessible, and the world as we have it is illusion. The only way we can steer safely between the Scylla of materialism and the Charybdis of static idealism is by keeping before our minds the concept of direction. This makes purposive significance possible without stopping the universe. It also pieces out the ideal beyond our finite purposes, instead of making it a mere unaccountable fragment in the process without any setting in the universe as a whole.

Form and Ethical Realization

We estimate the ethical worth of life by its form, its direction. This direction must not be a mere function of what each individual desires. To make the satisfaction of impulse its own criterion would destroy all criteria. For impulse is legion, and life would resolve itself into a chaos of conflicting desires; into what seems to each individual moment. If satisfaction is the test of worth, then whose satisfaction, that of the pig or the man, the fool or Socrates? The worst tragedy of all perhaps is that some are satisfied when they ought not to be. The optimism that the satisfaction of impulse is a sufficient standard presupposes a preëstablished harmony between inclination and right, the individual and the whole, the present and the future, which has not been attained and which can only come by the accommodation of impulse to a standard more objective than itself. The limit which in the end determines worth must itself be independent of impulse. That definite lines of conduct exist must somehow be due to it. This is real idealism, as opposed to naturalism under whatever guise, spiritualistic or materialistic. Naturalism makes the Ought a mere function of what is. On the contrary, it must legislate to that which is. What pleases may not be what ought to please, and if we indulge in tendencies that ought not to please us, a standard, objective to ourselves, forced upon us by the cosmic process, must sooner or later condemn us.

It has been held that the ideal must be the outgrowth and index of impulse; else there could be no false judgments. But how could there be either true or false judgments if impulse is its own criterion? These involve a reference to a constitution beyond impulse. They imply an objective form. We must, of course, admit that ideals appear at a certain stage in the biological series; but when they appear, they appear as leaps, as new ways of evaluation, not as mere products of the past. Why do such leaps rather than others prove to have permanent significance? This must be because the universe somehow has a direction of its own. It is not accounted for by mere chance. If ideals cannot pass upon impulses unless they grow out of them, they surely cannot do so if they *merely* grow out of them. They must have their own credentials. Strange that thinkers who ridicule Plato for hypostasizing the Idea of the Good, which when properly understood is more than an hypostasis, should find it so easy to hypostasize the mechanical ideal of atoms and molecules.

To say with the Hegelians that the ideal is already implicit or potential in the impulses must mean very much the same thing, if it means anything. That impulses are good or bad is hardly implied in the impulses. The question of worth can arise only when impulses are evaluated according to an objective standard. That the impulsive satisfaction has worth in the end is not due to its being desired, but that it fits an objective constitution, present and future. This gives "immortal intent" to the process. That the eternally prudent may be sacrifice, that what it aims at cannot as such survive, can be no part of short-sighted impulse.

Hedonism, when sorely pressed, must have recourse to "on the whole and in the long run," not realizing that it thus abandons satisfaction or pleasure as the ultimate standard, and substitutes a selective constitution. It is this, and not the mere subjective satisfaction or dissatisfaction, which decides what structures can survive and therefore what pleasures can survive.

Neither does self-realization furnish a final standard. Consistently stated, it is simply natural history, not ethics. Practically, it would mean the riot of absolute individualism. Perhaps the most picturesque statement of this doctrine is the speech of Aristophanes in Plato's "Symposium." The myth of the division of the double men and double women and the men-women and each half longing for the other, signifies that love, or the yearning of the soul, means self-completion or the attaining of one's own, the complement of one's being. We must not, however, neglect the qualitative difference in selves. There are many types of selves, and each type desires its own fulfillment. If self-realization is to be the criterion of life, what self is to be realized, the baboon self, the pig self, or what sort of self? If all but human selves are to be excluded, what sort of human self? Not the criminal self nor the insane self, surely? Only a *normal* self could be the standard. As Plato says: "He must be a wise man who is a measure." But what is normal?

Psychologically viewed, the ego may sometimes aim to realize or define itself. It may aim to realize social institutions. It does aim to realize its own tendencies, egoistic and social. But what determines the worth of the activity is not the mere realization of tendencies, but its conformity to the ideals of the race and ultimately to the direction of history. Perhaps such a self has no business to be. Its whole universe or perspective may be sordid and mean, its complement brutal. In that case, the ethical process is not self-realization, but the elimination of that type of ego. The doctrine of self-realization, tacitly at least, assumes a preëstablished harmony between the ideals of the individual and the whole, or that if each one desires his own realization he at the same time desires the good of the whole. Such a fallacy could only be maintained by such ambiguous shiftings as that between the real good as opposed to the apparent, the true to the actual, the eternal to the temporal, in all of which it takes no great insight to see that there is a reference to a constitution beyond the individual ego.

Biologically, self-realization can hardly be seriously maintained as a final standard. We have become so constituted, as a result of the demands of the universe upon us, that we respond in certain ways. To look out for ourselves is only one of the many demands that are made upon us. Our adjustment in the nature of things is largely institutional, and must become more so, as a result both of biological and social heredity. To fit into institutions, present and future, must therefore be the biological test of an ego worth preserving. The test in the end is extra-individual. And as institutions are also subject to the law of survival, the test becomes extra-institutional as well. It again implies the attribute of direction. A man, moreover, who should be as self-conscious as the self-realization theory demands would be a pretty sickly sort of specimen. Not self-completion, but the yearning for an objective Good, to refer to Plato again, is true realization.

The fallacy of the doctrine of self-realization, in spite of much that is noble in its appeal, is that it takes human nature as an absolute entity. The fact is that human nature is essentially in the making, and that it differs in quality in different individuals, and at different stages of development. Primitive man, so far from being a little lower than the angels, was not much above the brutes. The finer instincts and emotions have developed by degrees through social selection. And the process of making man in the image of God, shaped to live with his kind in justice and love, is still going on, and must go on for countless ages. There are a few individuals of exceptional nobleness of quality, whose realization seems supremely worth while ; these are prophetic of humanity to come, and their greatness lies in divining and incarnating the universal of the race. True realization must mean a better social order, an improved humanity, a higher type of personality. It cannot be written in merely egocentric terms, but has its base in a progressive humanity, and in the cosmic order of which humanity is a part. It is here that the standard must be found in the last analysis. Impelled by a faith which we can but dimly understand — a faith which has led the race through a long past in search of the promise — we must be willing to risk and sacrifice for this greater humanity, whatever may be our personal fortunes. Out of such stuff is progress made.

Since Spencer's time it has been fashionable to speak of ideal activity as adjustment. It is not always clear what the adjustment is to. It must be to some sort of environment. But what is the environment to which the soul must adjust itself? It is not merely present sense-perceptions, surely. The adjustment must be to the future as well as to the present. It must be capable of being taken up into the cumulative movement of history. The present ideal attitudes must fit into the future process of life. To hold that the ideal is at each stage of the process a mere function of the *is*, the result of the accidental shooting together of the various tendencies of human nature, and also hold that it has the right to control and evaluate these tendencies, is even more incredible than the materialistic statement that the ideal is a mere epiphenomenon, irrelevant to the going on of the real process. But the latter bankrupts all truth seeking and all ideal endeavor. Epiphenomenon is after all only a technical name for a lie. Why should the process produce something which does not express its real nature, has nothing to do with its existence, an unaccountable illusion?

Neither can we find a final standard, as some maintain, in the consensus of likes and dislikes. It is true that the most important part of the adjustment of civilized man is to the institutional ideals and customs of the race. These furnish a provisional measuring rod for individual life. But social agreement, while on the whole a safer test than individual desire, is not absolute. Can any thinking man be satisfied in merely obeying the oracle of Delphi, "to worship the gods according to the laws of the land"? Socrates may have meant to do so, but the Athenians were right, that he introduced strange gods, — new ideals hostile to their conventions. Every institutional embodiment of form is relative.

Nor can individual reason furnish an absolute criterion, however important in recognizing the relativity of our concrete ideals and the need of a standard. Sometimes, indeed, the individual is wiser than society. Else there could be no progress. As Heraclitus says: "It is the law, too, that we obey the counsel of one." But individual reason at best is dependent upon its historic setting. It is limited by the axioms of its immediate social nexus, the ideals and sentiments of the age. It finds that reasonable to which it is accustomed. It easily finds arguments for the stake or the golden rule, the Inquisition or the French Revolution, according to its setting. An appeal to pure reason cannot lift us above the relativity of history. The rational self like "the economic man" or "the average individual" is a convenient fiction. At most, it is an ideal limit to which we can give a general form, but no content. If it exists now, it must dip in, like Emerson's Oversoul, from a superindividual sphere. It if does so infiltrate under favorable conditions, it can only be apprehended in terms of our concrete experience, and so the apprehension of it becomes finite and relative. It is not a separate compartment in our mundane self, "unspotted from the world."

Even if there is a more comprehensive reason than human reason; granting that such a reason can know the total object of science, the present constitution of things, with its laws and uniformities, in a real time world such as ours, such a reason is limited. It could not, except hypothetically, read off the future. Its attitudes toward the future must be pragmatic postulates; and nothing would seem more certain than the transformation of present values. Even such a reason would presuppose direction, beside present omniscience for the validity of its judgments. Its judgments would have to fit into the future, as well as into the present, to be absolutely true. How much more evident must it be that our reason does not constitute its own world, present and future! We cannot now be said to mean what we do not mean; and when a richer meaning supplants the poorer and more selfish, that is not because we meant more than we meant or because we wanted failure when we sought success. Paradoxes do not explain. We must take account of the creative aspect of the process. In the process as we become more deeply conscious of its formal demands, the superficiality of our former insights comes to light. If we learn modesty in regard to truth as we have it, that is not because we know more than we know, or possess an absolute truth, but because we have learned from the past that our truth, however satisfying for the time, is provisional. There is a constitution which transcends our purposes, whether individual or social. This selects or eliminates in the course of the process.

Evolution and Direction

A generation ago, in the first enthusiasm of Darwin's discovery, evolution seemed the magic key to all mysteries. But the criterion of the survival of the fittest has meaning only when we define what environment is intended. Otherwise it amounts merely to saying that what does survive is fit. If we mean by fitness, conformity to a temporary environment, then it may indeed happen that under certain conditions, the inferior is better adapted to survive. The hostile micro-organisms which get the better of us in disease and death would thus prove themselves our superiors.

Evolution, therefore, must derive its meaning from the conception of direction. Even such fragmentary cumulation of significance, as we find, would otherwise be meaningless, for we could have no reason for supposing that the later is any better or truer than the earlier, even on the whole and in the long run, or that the process ought to be read one way rather than the other, unless we assume such a cumulative direction. This is the real measure of the process. The prerational stages of the process, whether individual or racial, cosmic or human, would be irrelevant to reason unless they somehow prefigured or were prophetic of reason, *i.e.* unless they had form. That there shall be reason cannot be an accident, if we *can* reason about things. When at last man awakes from the long slumber of the ages, pregnant with tendencies which ages of selection have forced upon him independently of his individual will, "he lays his hand on his bosom and feels it is warm with a flame out of heaven" — a yearning for that which, for our present consciousness, is not and yet gives meaning and value to that which is. It is this which makes the time process ever mean more than it knows — not *its* wisdom, but rather that in spite of its blindness it comes to fit into a larger pattern. This makes the present, in so far as it is meaningful, fulfill the past in so far as it has form; and as the checkered web of the time process emerges out of its instinctive darkness into the future, this formal constitution furnishes the warp which insures a unified whole.

This form or direction is not originated with reflection. Reflection cannot create this demand for meaning and unity, for it presupposes this very demand. It is not a will attitude. If it were, it would be subject to the law of change, and so could not furnish the absolute limit of our striving. It is not the result of experience, because experience only comes to have meaning and value with reference to it. Neither can time create it, for time has no direction, knows no ideal. It can but transmute endlessly that which is, each after its kind. What shall survive, if anything but chaos, must be left to another principle. For "time," as Heraclitus has so strikingly put it, "is a child playing draughts." In the flux of process, individual desire and social institutions, intuition and reflection, prove alike relative. What remains is only the direction. This must be real, else there is no meaning. This is the ontological limit of truth and worth, forced upon the individual by the constitution of reality and the necessities of life, not a mere ideal positing. Provisionally, we may regard our demands for meaning and worth as biological categories. They do appear in the evolutionary process. They are involved in race experience, and have been forced upon us by race survival. But this only pushes the question back. Why are they conditions of race survival? For we must look at these conditions not only from the point of view of the individual, but of the whole process. They must somehow be involved in the formal constitution of reality throughout the time process, thus to condition reflection and life alike. They are the manifestations or incarnations in history of that eternal form, which is with us always from nebula to society, for even the astronomer and the geologist insist that their facts are amenable to categories of form.

If you ask how such a formal constitution can condition the process of evolution, and yet not be energy, I would point out on the one hand, that if we must assume such a constitution in order to make experience intelligible, then it must exist. And, on the other hand, I would point to other attributes of reality which, though not energy, do definitely condition the world of energetic reactions. Such an attribute for example we have found pure space to be with its condition of distance. We have exaggerated the importance of causal or quantitative determinations. We are familiar in human experience with other types of determination, logical, ethical, and æsthetic, which are more fundamental for human relations. The brute force of an individual or a group is less essential to social survival than teleological fitness, the capacity for organization. And in the cosmic process, in the large, formal determination may be more essential to the survival of structures than brute quantity. But if form is not a cause, how can it make a difference to our world of process? We may find hints in our own social evolution of how form may become efficacious. It is not the vociferousness of the argument or the quantitative mass of the art work that makes them prevail in our human experience. What makes them win us over and determine our conduct and appreciation is that they fit into the formal requirements of our mental constitution and bring this into clearer relief. The survival of man, or at least his standing in organized society, consists in adopting or imitating certain forms, certain types of conduct — conventional, legal, ethical, religious, etc. The forms as such have no causal efficacy. Their efficacy comes from their coërciveness upon the will of the group. In imitating them, the member of the group survives, so far as the special demands of that group are concerned. A whole group, again, may be destroyed by another group which has a superior organization. Form thus figures as an aspect of efficient action, though it is not as an abstraction efficacious. We strive for it because it is implied in our structure.

While it is not necessary that the producer, be he artist, scientist, or reformer, be explicitly conscious of form, yet the critic in examining his work can see that such formal demands are realized. The creative result is approved, whether by contemporaries or by posterity, not because of the mechanical tools employed or the psychological attitude of the particular producer or spectator, but because they conform to the formal postulates, which the producer imitated or brought to expression. We do not ask: Was the producer conscious of the form? We only ask: Does the result conform? The formal survival has to do, not with the method of production, but with the acceptability of the unities produced. If they fail to get the approval of the race, they may perhaps survive as raw material for fresh attempts, as Ibsen's button molder proposes to melt up worthless human life in his ladle, but they cannot persist as formal unities, whether science, art, or social institutions.

If there is in the universe a perfect Socius, an omniscient selective activity, with power commensurate with his formal demands, then we can see how in nature and the universe at large, as well as in race history, form can be a category of survival. As forms, only those unities would survive, in the long run of his patience, which he approves. Such a being would guarantee that universal efficacy of form in the cosmos which we implicitly postulate. Thus the universe, while, in the concrete and actual, it cannot be said to be a whole, would be guaranteed potentially as a whole, or at any rate wholes would be guaranteed within it; for only certain organizations of energy would prevail as acceptable. The values which we imply in all our idealizing activity, logical, æsthetic, ethical, could be potentially or virtually guaranteed even now, for only those structures which imitate, or are in the direction of, this selective activity would survive.

Whatever may be the coërciveness of such a faith, it is a fact that cannot be gainsaid that architecture or form must be taken account of as a condition of stability or instability in the world as we know it. In the case of chemical compounds, some proportions of elements are stable, some are unstable. Hydrogen and oxygen have a high degree of stability in the combining relation of water, while in other proportions they enter into the most unstable of compounds. The difference here is not in the elements themselves, but in the numerical ratio, which, therefore, must be regarded as a factor. Even more striking is nature's respect for architecture in the case of organic structures. Mendel's law shows how jealous nature is of the preservation of the type. Cross-breeding of types either leads to sterility, where the types constitute remote species; or where they are less variant, leads to segregation of the original characters thus blended and the reëstablishing of the original types. Thus nature enforces a certain simplicity of form where otherwise would exist endless chaos. The same tendency might be illustrated in the history of ideal activity, as in the æsthetic and institutional structures of the race, where again definite types tend to prevail, giving direction to what would otherwise be promiscuous individual variations.

The world of change and external contiguity can to a degree, even in our finite selective activity, be taken up into contexts of meaning and validity. This process of taking over the brute world, with its mechanical uniformities, is going on in science, art, and institutions with their selective survival conditions, however limited may be the results. That such a selection is a fact, a normal fact of the functioning of the universe, and that it points to a formal constitution of which we must become conscious and which individual insight must seize upon, if it would be immortal, we also realize from human experience. No human convention can make a poem or a painting immortal. It must be such intrinsically by anticipating the universal, which social and individual experience alike must acknowledge. It must be true to a form which eternally exists, unmoved by change, in order to constitute worth and eternity within change. Such a constitution must have been ever operative, or it could not be operative now. As formal selection *is* genuinely effective in the case of one part of reality, it cannot be an accident, but must be regarded as an expression of the universe. And why should we suppose that the form waits on human wills alone for being operative? Is it not easier to suppose that somehow this formal selection is always going on in the cosmos, subjecting the thing-order to the order of ideals, and that our acknowledgment and our significant activity is prepared for and a part of this cosmic selection? Why should we not trust our faith in the formal categories as we trust our faith in the mechanical?

The One and The Many

The perennial problem of the one and the many finds its only intelligible solution in the recognition of such a direction. The dialectic as to whether the universe is really one, and the many an illusion — or whether it is really many, and the unity an illusion — has been waged long, though usually with bloodless damage to both sides. The atomists of all types, whether believers in the quantitative entities of Democritus, or in the spiritual monads of Leibniz or the qualities of Herbart, have found it necessary to account for the apparent unity as arbitrary and seeming. The monists again, from Parmenides down, have been equally forced to sacrifice the apparent plurality within the world. Brave souls who have had more respect for the facts than for logical consistency have compromised and admitted both the one and the many with varying emphasis according to their peculiar bias. One thing is certain, that on the basis of a static conception of the world, the problem of the one and the many remains as impossible as ever.

Nor is a dynamic conception of the world by itself any more satisfactory. That the universe is process or transformation does not tell us anything about its relative unity or plurality. Process in itself may mean greater chaos as well as greater unity. It furnishes no guaranty one way or the other. It tells us nothing in so far as it is a mere time process about its *whither*. Still we insist that our world shall be a whole and not a mere chaos. This is the eternal inspiration of scientific research as well as of practical life. Yet how ridiculously meager is the evidence for our faith. Kleinpeter tells us that his master, Mach, proceeds inductively as regards this unity, while philosophy proceeds deductively. Have the fair maiden's dreams of love, and her golden hair flying in the breeze, and the prairie zephyrs all been comprehended within one inductive unity? That they ever will be so is an audacious dream.

We are agreeing now that if there is to be unity it must be a teleological unity. The dust storm can be understood as one with love's fair dream only when they can be seen as part of one converging purpose. Plato felt his way toward such a teleological unity when he crowned his hierarchy of Ideas with the Idea of the Good. But the dynamic cement of process was lacking, and the loose stones would not hold together. If we assume the attribute of direction, it seems to me we shall have the necessary regulative principle. Granting, on the one hand, a universe of flux with ever new variations, and, on the other, an objective form, selective or legislative to this flux, in eliminating those transmutations which do not fit its direction — granting this not only as an experiential, but as a cosmic principle, and a degree of unity at any one time would be guaranteed, and in the long run, the successive stages of the process would show cumulative significance, with a backward and a forward reference. Such a universe, too, with its original diversity of stuff to be transformed, with the possibility of ever fresh variations, not precluded by such uniformity as exists in the transmutations — such a universe would also account for the outstanding plurality and opaqueness in any given stage of the process. And as the process, moreover, is as eternal as the direction, the pluralism could not disappear, though it might grow more articulate here and there, and so make disjunctive judgments of the future more possible.

The conception of immortality as the persistence of individual unity, can be given real meaning only if we assume the attribute of direction. Mere existence, and the tendency to persist *in esse suo* cannot guarantee immortality. The question is not, does an individual desire to persist? Or does he have a specific content? But is he worthy to persist? Is the content significant? In the history of art and institutions, as well as in the history of thought, we learn that only those structures and contents which fit into the future of the process can survive. But if worth is to be a condition of survival, the process must be fundamentally selective. It must have direction.

The Ought

We may define the Ought as the consciousness of the form-character of the universe. As the chord in music has its form; and as each movement of the symphony, as well as the symphony as a whole, has its form, so we may think of the total movement of cosmic evolution as having its unique form, giving direction and unity in the large, to its totality of interlocking parts. It is the law of the whole of which we finite parts become gradually conscious in our ideal activity, as we strive to understand and to appreciate the world of which we are the more or less articulate expression. In our imperfect finite development, this law of the whole, as striven for by our will, must necessarily appear as an Ought.

For purely theoretical purposes, a constitution which should select automatically and unconsciously on the basis of form, might satisfy our requirements. That such cosmic selection is going on, is shown by the very fact that reason is at home in the world, and that laws can be formulated in a world of flux. For ethical and religious purposes, however, we seem to require more than an automatic constitution. We need the sense of comradeship, the sympathetic participation by the larger world in our fleeting and disproportionate striving. We need to feel, not only that the universe enforces an impersonal order, but that, somehow, a power greater than ourselves, and representing the more of our best, helps us to realize our creative destiny.[1] Just because reality is characterized by change, and is in some degree plastic, it becomes possible consciously so to direct this transformation, whether as regards our individual or our collective lives, as to meliorate the past, and atone in part for its failures. And because the process is cumulative, and our imperfect efforts must enter into the creative process of the future, and there find their correction and supplementation, it becomes possible to approximate in the historic process towards a more perfectly realized form. This, moreover, our religious faith makes real to us as a present companionship with a perfect Socius, stimulating our best and atoning in some measure, through its regenerative influence, for our worst. Such a being makes real and concrete to our imagination and emotion the objectivity of the Ought.

The faith in such a selective process furnishes a sufficient guarantee for our ideal striving. This is not a mere Utopian or *laissez faire* optimism. There is real evil in the world, real maladjustments, false viewpoints. But though the wicked flourish like a green bay tree, their type shall not prevail. The servant of Jehovah shall eventually triumph, though perhaps through labor and suffering. The righteous remnant shall survive and inherit the kingdom. Only the just state can maintain itself. And because the mills of the gods grind exceeding fine, though perhaps slowly, we can afford to be tolerant, and to wait. "Let the tares grow with the wheat until the harvest." And the harvest is the sifting by the progressive process itself. In view of our ignorance of the future, our motto, just as far as our decent living together permits, should be: Judge not. Let it be. The divine direction of history will see to it, in the struggle of ideals, that the superficial and ephemeral are eliminated. Thus man can labor and wait with confidence as regards the final outcome. And if he is made of the right kind of stuff, he will be willing to have his own ideals, yea, even himself, eliminated if unworthy to survive. In this willingness, at least, he will prove his superiority to chance.

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[1] See "The Function of Religion," the *Biblical World*, August, 1915.

Will the kingdom-not-of-this-world and the kingdom-of-this-world ever be one; will stuff and form, the traveler and the path, ever blend into one unity? Will the third kingdom, prophesied by Ibsen in his "Emperor and Galilean," the kingdom of God-Caesar or Caesar-God, ever be a finished actuality? Not while the world is process. So long as there are transformations, so long must the mills of the gods grind, and so long will the content and meaning of the world be ever new. No, to make circumstance plastic in the service of the Ought is the task and the joy, too, of life, at least of healthy life. The real other, the completer life, is not an absolute system of truth which we now possess and intentionally hide for the purposes of the dialectic game; but the yet unborn, the insight we have not seen. Any theory which ignores this must make history and duty a mere farce. The universe is process, but through the process the selective direction sets the conditions of survival and meaning.

There will always be tired souls, who want rest above all other things; but this must be a rest which the world cannot give, a rest in seeking and realizing the ideal. The satisfaction we *now* seek may itself, in a further stage of the process, be seen to be relative and unworthy. To stop at that would be lazy, cowardly, and immoral. The real satisfaction lies ever beyond in the completer life. Art tries to steal from the fleeting moments their meaning, and to frame it; and it rests us for a moment. But this satisfaction, too, is relative. The songs of our childhood satisfy our soul no more. The satisfaction of the Greek world is not our satisfaction.

The only way, finally, which I can serve the eternal Ought is by serving for the time being the Ought incarnated in my meaning and in human history. To quote Heraclitus again, "It is not meet to act and speak like men asleep." We are here to think and to create. Whether we are awake or asleep, whether we think or dream away life, we are subject to the law of change and the law of direction. But if we think, we may enter into the eternal in some degree by striving to understand the direction of things, and by guiding our lives accordingly; we may become creators instead of mere bubbles on the stream. By acting out my best purposes, by living my highest insight, there shall come, perhaps through failure, perhaps through partial success, how I do not know, new insight, new capacity for work, love, and appreciation. The guiding power of the universe will see to it, if we are sincere, that we do not permanently miss the course in the foggy unknown. But our illumination must be the Ought as now incarnated in human history. The next incarnation will come in the fullness of time. The voice out of the dark is enough for the next step.

CHAPTER XVIII

Teleological Idealism

The question about the whence and whither of the drift of our cosmic weather is an old one and cannot be lightly brushed aside. It is both a forced and a momentous issue. It is a forced issue because we cannot help taking an attitude towards it, whether we make it explicit to ourselves or not. It is momentous because such an attitude is a serious index of our deepest practical faith as regards the value of life, and cannot help determining our conduct. There have been three distinct types of theory in the past as regards this drift, — mechanism, finalism and vitalism.

I. *Theories of Evolution*

Mechanism. — In considering mechanism we must be careful not to be misled by the name, which is after all but a figure of speech. The view of the scientific naturalist of to-day has little in common with the mechanical theory of the eighteenth century. His interest, as must always be the case with science, is in efficient causes, and in so far he is not committed to any special type of metaphysics. He is but trying to discover the determining factors in the series of dynamic situations that occur in experience. As regards the constitution of these situations he is not necessarily an abstract atomist. It is true that the atomic hypothesis in chemistry and Mendel's theory of unit characters in biology have proved highly convenient in studying chemical and biological processes, but recent scientific research has shown that such an atomism, if taken in the abstract, breaks down. The Mendelian units, for example, are not effective as abstract elements. They figure within dynamic situations which they enable us to predict. Sometimes two unit characters may figure as one for the purpose of prediction. In any case we must take account of the dynamic context in order to have satisfactory explanation. This is equally true of other biological abstractions, such as sex determinants. They are only efficient in the situations in which they figure and which we cannot afford to ignore. The mechanical view, in the science of the present day, amounts to this, that in the case of life as well as in the inorganic world we must examine the chemical constitution of the process. We must analyze the dynamic situation into its chemical factors and their positional values. The effects of the presence or absence of these factors must be discovered, their quantitative variations in the situations under experimental control must be studied, and the effects of external conditions noted. There is no metaphysical short cut to an understanding of the process of life, any more than to an understanding of other dynamic processes.

As for the unique chemical compounds which pertain to living organisms, natural science, accepting them as facts, as it accepts other actual compounds, is inclined to assume continuity as between the organic and the inorganic, and to reduce the difference to one of complexity. The chemist's success in artificially producing "organic" substances in the laboratory, — a success which has been ever increasing since the organic compound of urea was artificially produced a century or more ago — has stimulated the naturalist to believe that it may hereafter be possible to produce living organisms out of what we call inorganic elements, or at any rate our failure to do so in the past may be due to our ignorance and not to any inherent absurdity in the idea.

Now if the attitude of mechanism be understood in this naturalistic sense, nothing can be said against its procedure. Its results in successsful prediction have been truly marvelous, considering the short time for which the method has been seriously tried. The revising of special hypotheses must be dictated by the facts, not by any *a priori* objections. Thus it is now generally recognized that the Darwinian hypothesis of natural selection, epoch making as it was and useful as it still is, is only a partial account of the facts. Natural selection is a negative factor in evolution. As Driesch puts it, to regard natural selection "as a positive factor in descent would be to confound the sufficient reason for the non-existence of what is not with the sufficient reason of what is." The positive ground for variation and continuity must be found within the process.

The only question that can be raised as to the mechanistic hypothesis is whether it is adequate as an ultimate philosophy. Can this external and seemingly blind dynamism account for the direction of the process, and for the outcome as we find it in the higher stages of life? Can we read the whole history of the universe solely in terms of the categories which have proven so convenient on the simpler levels of existence? The postulate of continuity should apply, it would seem, as well when read from above down as when read from below up. And, after all, we have a much more intimate knowledge of processes and their implications in the highest stages, of which our will and ideals are a part, than we can ever possess of the dynamism of the lower stages of nature. In the former case we have a first-hand acquaintance with the inner transitions and unities; in the latter we are at best outside and speculative spectators.

Finalism. — Finalism, as opposed to mechanism, has always taken the point of view that we must judge evolution by its outcome, its last stages. We know the potentialities of the acorn when we have seen it grow up as the oak, of the child when its capacities are displayed in the grown man. So we must know nature by its outcome in our striving for ideals. Under the theory of mechanism, the process is accounted for by the factors discoverable in the previous stage of the sequence, together with the external conditions which play upon them; for finalism the causality lies in the future, in the prospective value of the process.

For working out this view we must go back to Plato and Aristotle as models. In opposition to the naturalistic method of their day, they insisted that evolution must be explained by its purpose, the Idea, or form, to which it tends. The two Greek thinkers differ somewhat in details, but Plato must be regarded as the original master of this type of view.

For Plato the world of sense, the existence of which he does not deny, is a poor effort to copy a world of eternal Ideas. These alone are real. On this theory of a copy, Plato is driven to assume that there are as many Ideas not only as there are ideals and class types, but as there are individuals and types of relations. This forces him eventually to regard mathematics as the type of the real, since only here can he find ideal possibilities adequate to the originals of the distorted shadows which make up the phenomenal world. With this phenomenal world Plato manifests a poetic impatience. He would not trouble himself so much with the mechanism of movement, so important to Aristotle. He would go directly to the end, which is the Good. Aristotle, while he largely copies his master, places more confidence in the world of actual process, in the potentialities of matter. The concrete process is the first reality. But this process finds its explanation in the conception of a goal, its final cause. Here shows the artistic consciousness of the Greek; life and nature, too, work as the artist. In either of these views the end is conceived as the moving cause. "It is the conception of a thing which produces motion alike in works of nature and of art. Only man can beget man. Only the conception of health can determine the physician in producing health. In like manner we shall find in the highest cause which is God, the pure form, the ultimate end of the world and the source of its movement united in one."[1]

But obviously the end cannot be conceived to be consciously present in the case of the lower processes. How can they then develop in the direction of their characteristic activities? In other words, how can the form be effective? Since God is the goal and the final cause of the movement of the universe, how does God act upon the world? Here Aristotle wavers between two methods. He sometimes speaks in quite mechanical terms. God gives a push from without to the outer circle of the universe, and thus makes it move. But the more characteristic method of Aristotle is to look upon God as self-contained activity and bliss, moving the world by his perfection. The beloved does not need to do anything to the lover; for the lover is moved by the beauty of the beloved. So the universe moves because it desires perfection.[2] This perfection, moreover, is different for different classes; vegetable, animal, or human, each moves to realize its own proper function, its characteristic soul.

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[1] Quoted from Zeller, "Aristotle," Vol. I, pp. 356, 357.

[2] In Zeller's paraphrase of Aristotle: "God moves the world in this way: The object of desire and the object of thought cause motion without moving themselves. But these motive forces are ultimately the same (the absolute object of thought is the absolutely desirable, or pure good); for the object of

Hence, it is necessary, in order to explain the diversity of the process, to assume in addition to God a multiplicity of forms, — entelechies, or conceptions. Just what relation these bear to the final form, God, Aristotle does not tell us; he takes them for granted from experience. His faith in the concrete process, however, gives him the advantage that he can regard the process itself as really moving, and also that he can make this concrete process bear part of the responsibility. Thus the individuality of the process is due not to its form but to its matter. Hence, forms are genera, not particulars. Here, again, his solution of the problem is tantalizingly vague. And, naturally, he has little to say about immortality, that is, the final significance of the individual.

A more serious question is why the process should desire the form. What relation do the conceptions, or entelechies, bear to the process itself? If they did not exist as second realities, would it make any difference to the process? Would not the process move by its own immanent tendency? In that case the conceptions, serving as final causes, would seem to be after-thoughts. But Aristotle is too anthropomorphic to be troubled by such questions; for him to the end it is the conceptions which move matter, although "only the master workers know the reason why. Manual workers, like lifeless things, work by habit."

That there is truth in the finalist's contention we shall find abundant reason to see. But the solution suggested by Plato and Aristotle is far too easy and abstract. A biologist of the present day, Driesch,[1] has attempted to give Aristotle's view a more modern and scientific statement. Driesch insists that

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desire is apparent beauty, while the original object of will is real beauty, but desire is conditioned by the notion (of the value of the object) and not *vice versa*. Thought, therefore, is the starting point or principle. Thought, however, is set in motion by the object of the thought; but only one of the two series is absolutely intelligible, and in this Being stands first defined as simple and actual." *Meta*. XII, 7, 1072, a, 26. "The final cause operates like a loved object, and that which is moved by it communicates motion to the rest." *Meta*. 1072, 6, 3.

[1] "Philosophy of the Organism" (Macmillan).

we cannot account for the prospective value of the parts of protoplasm, as shown especially in restitution and heredity, unless we introduce entelechies. "An entelechy means the faculty of achieving '*forma essentialis*.'" Now these entelechies, while figuring in the process, are not on the one hand psychological entities, nor on the other are they energies. They can, however, be best understood from psychological analogies. They are selective. They perform functions which resemble judging and liking, willing and thinking. Yet, while they are not energies, they can under certain conditions suspend the energetic reactions; and they have a regulative function in the process. But while Driesch's attempt to get away from the anthropomorphism of Aristotle is commendable, it must be said that Aristotle's final causes are at least intelligible, being drawn from our experience of certain processes where they do hold. Valuable as is Driesch's empirical work, his entelechies seem to have no meaning at all; they are merely duplicates of the selective and prospective tendencies of the process. Moreover, such a selective function is by no means limited to the organic realm; we find it, though with less complicated working, in the chemical affinities. In any case, it is hard to see what we have gained by hypostasizing such tendencies and giving them a Greek name.

Vitalism. — Mechanism and classical finalism deal with partial aspects of the process. Vitalism attempts to find a common denominator for the process as a whole.

Bergson[1] and others have pointed out with great clearness that the correlative growth of organs and functions in organic life, for example in the eye, could not be accounted for by mere accidental variations and natural selection. If in any one part such variations were considerable and abrupt, as in the case of mutations, they would only interfere the more with the functioning of the organ. If they were small they might not interfere, but they would have to accumulate through ages, and correlative changes in this and other organs would have to take place, so as to produce harmonious adjustment or adaptive functioning. This is almost impossible to conceive on the basis of chance.

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[1] "Creative Evolution" (Henry Holt & Co.).

So with the different directions in which evolution has proceeded. These directions must be implied in the process, even though we can only read them backwards, as at sea we read the direction of the ship's movement from the silver wake where we have passed.

As between mechanism and intellectual finalism, Bergson suggests the middle ground of vital impulse, in which is implied the complexity that afterwards appears, when evolution splits up in the struggle with the environment, as the potential effects of the skyrocket appear when it bursts in the air. The most important of these tendencies are the split of life into the vegetable and animal, and the dissociation of mind into instinct and intelligence. Evolution is division. In the division, however, there remains a suggestion of the other side; some common characters, however secondary, abide. Plant life carries a blend of the animal; intelligence a blend of instinct. The progress and continuity of the process in either case are to be accounted for by the push from behind of the common vital impulse.

Whether this vital impulse, as a distinct determinant in the evolution of life, must be added to the chemical determinants with which naturalism deals, must be decided by scientific evidence. Once admit creative evolution in general, and recognize in particular that every compound must be regarded as a creative result, possessing a new and unique set of reactions and not a mere addition of the characters of the separately known elements which enter into it,—and the conceptual difficulty disappears. Whether, as externally viewed, life itself can be regarded as a compound, or whether to produce life some new factor must be supposed to have been added from without, must be decided upon evidence. At present the difficulties of conceiving that life was introduced from outside into our planet seem at least as great as those of the theory that it arose from certain antecedent conditions on our planet. In any case, we are dealing essentially with mechanism. Vital impulse, as pictured by Bergson, is no less blind than the elements of chemistry. Its structure, in order to account for all the diversity of life, must be no less atomic than science has pictured the physical structure to be. Moreover, synthesis would seem to be as characteristic of evolution as division; and if so, why may not life itself be regarded as a new synthesis, under specific conditions, in the creative process?

The trouble with the hypothesis of vital impulse is that, like any conception that tries to explain everything, it explains nothing. We still have the diversity of the process, with its direction, to account for. To say that what does happen can happen, is self-evident, and that is all that vitalism tells us. In trying to explain everything from below, the higher from the more primitive, it is pragmatically indistinguishable from the naturalistic mechanism which it condemns. The latter at least furnishes the only empirically fruitful method of investigating the apparent sequences of life. To account, further, for the direction or meaning of the process, we must have something besides a blind *vis a tergo*. What this means we must presently see more in detail.

It is at least infinitely improbable that mere chance, or mere external conjunction, whether in terms of vitalism or of chemical mechanism, should have accomplished the results of organization, with the compensatory adjustments involved in the evolution of life and mind. There must be some continuity which enables us to read down from the higher as well as to read up from the lower.

It is also unlikely that *all* life is a compound having the potentiality of the development of the higher forms with their awakening ideals. It is easier to suppose that life, as Maxwell supposes in regard to matter, has its omniscient sorting demon who interpenetrates and selects in accordance with certain standards. In other words, the natural order must be thought of as interpenetrated by an intelligent order. Aristotle's failure to make form (in the sense of ideal conceptions) effective, and his recourse to mechanical push to move the universe, should show us that form, in order to be efficient, must dip into the dynamic process itself, whether in a personal or impersonal way. In the plastic responsiveness of the natural order to this, the unseen order, would in that case lie its capacity for progress. This plasticity becomes more and more apparent in the higher orders of life with their vast complexity of possibilities and their organization for action. The nervous system is peculiarly the type of plastic responsiveness both to the unseen order which overarches and permeates and to the sense-order which establishes the immediate conditions of survival.

II. *A New Teleology Suggested*

We have little sympathy to-day with Plato's "heavenly pattern" and Aristotle's "final causes," that is, with ideal conceptions as determining existence and survival. We are apt to think of the process of evolution as blindly accomplishing its course as a result of internal and external accidents. At best, some would say, it is only in retrospect that nature finds that some ways of doing things seem good and so strives to preserve them. Mind itself, with its ideals, some have come to treat in this retrospective way. And any emphasis on ideals has been promptly treated as an hypostasis of our own abstractions. Chance variation is regarded as the mother of mind and form, ideals are but indications of the drift, not its *rationale*.

Even on this materialistic view, some use may be found for the "final form" of Aristotle. It represents, at any rate, the way we look back upon the series after its conclusion. Ideals and types, as our measures, form *a posteriori* a convenient instrument for viewing the flux, and furnish a certain subjective satisfaction. But can we stop here? Is the type, the "final form," a mere result of accident? Could the direction of the organic process, or of social ideals, have been the opposite, if accident so decreed? Is there no objective way of reading the series? Does it appear as it does, simply because we happen to be at this end of it? And when life repeats itself, with seemingly new efforts to reproduce a type, is this sufficiently accounted for by accident? Could thought have been constituted entirely otherwise? Is the whole story of life, from the chaotic protoplasm from which it started to the striving for truth and beauty, all a matter of blind variations, operated on by a blind environment?

However fully such a picture may do justice to our ignorance, it yet does not satisfy our reason. From the point of view of reason it is easier to read nature as striving to express certain types or ideals than to read ideals as chance. Nature seems to be, somehow, leading in the direction of human nature; the striving for a type somehow to be determining the direction of the series; and freedom and significant expression of life to be all the time the end to be realized.

I admit the difficulty of making this clear. But as a faith it ought to have, at any rate, the same opportunity as the materialistic faith in blind chance. If in our ignorance it makes the transitions of the facts easier for us, that gives it a pragmatic advantage over the more shocking rival faith. And I must confess that to me the culmination of a process in the appreciation of truth and beauty is more reasonably accounted for in a universe which has a fundamental formal character, and as such is selective, than in a universe in which this idealization is an accident. On such reasonableness we may finally have to rest our mode of understanding the significance of evolution. Some may call this a mere temperamental preference. In that case the temperament remains to be accounted for. To me this seems a fundamental demand for coherency and unity, while chance, formless happening, is fundamentally irrational — an apotheosis of our ignorance of the *modus operandi* of nature.

Whether the final cause operates through the inner striving of the process for its type, its final realization, or whether the efficiency of the final cause means the operation in the universe of an ideal will, after the analogy of the artist, interpenetrating our finite world of process, selecting and rejecting with reference to the realization of the type, — star type or man type, — must again be decided by our experience, fragmentary as this is. Different ages and minds find one or the other of these attitudes more congenial. In any case the form would in some sense preexist in the process; and in any case evolution would mean the differentiation of the organs for the proper realization of this form and, in man at least, for the significant sharing of it.

Mechanism, while true so far as it goes, is at best only an account of the physical conditions of heredity. Heredity does not mean merely the passing over of protoplasmic and chromosome potentials. It means also the arising of a unique conative disposition, through the impulse of generation. It is this which furnishes the architectonic principle of the developing life process. The chemical situation must be looked upon as the vehicle or instrument of this process. Heredity must be understood not merely as a physical stream, but also as a psychic stream, with its variations, its cumulation, and its characteristic categories.

The final theory of evolution must include both mechanism and finalism. For the time being, in predicting and controlling the process, we must work by efficient causes. Science has no choice in this matter. On the other hand, we must admit that the ideal selection of the later stages has some continuity with the earlier stages. When we try to read the process in the large, at any rate, we must somehow recognize the direction within it. We may choose to ignore the final reason of things, and limit ourselves to the description of sequences, but it nevertheless remains true that in part of the process formal selection is a reality, and no fair account can be given of evolution without recognizing this part and its relation to the whole. Invariable sequence, habit, recapitulation, and other external forms of linkage are but names for the facts. They merely indicate that facts do repeat themselves; they are not explanations. In some way the formal categories, of which we become conscious in human nature, must reveal to us the tendencies of nature; in some way the blossom on the tree of evolution must be indicative of the process which brought it into existence. The universe must be such as to account for the ideals which are a part of our experience, as well as for the externality and blindness which we find. As man in his small way, by his selection and emphasis of certain types of universe, is creative, so we must suppose that the process of which he is a part and which awakens to reflection in him is likewise creative. This need not mean that the later stages are present bodily in the earlier, or that the earlier stages work by "conceptions," but it means that somehow the categories which the later idealizing process brings to bear upon the earlier in our idealization of them are germane to these earlier and not accidental.

Of the two conceptions, the mechanistic and the teleological, the latter is the one that overlaps. By means of laws that are familiar to us in the later purposive stages we can account for the automatism, the mechanism, the seeming deadness of the world. By means of mechanism we cannot account for the seeming plasticity and value in parts of the process, at least not without falling back upon the miraculous, and so doing violence to our original concept. If we deny the reality of mind and ideals, we cannot account for the sense of promise of the world and of its openness toward the future, however convenient the conception of mechanism may be in epitomizing the past. In some way we must recognize emphasis and preferential selection, for human nature is part of nature.

That a universe should tend to realize a certain form is no more mysterious than that animals should turn toward or away from the light, or that the elements should attract or repel each other. In any case, in the last analysis, we must fall back upon the constitution of reality as discovered in experience, and regard that as reasonable which works out. That a possibility of reasonableness should exist in a world which evolves reason, seems certainly a reasonable demand.

It is the naturalistic materialist who has violated the principle of continuity in nature by cutting the higher stages of the process loose from the earlier. Why the materialist, who is always emphasizing continuity, should turn round when it comes to human nature and its ideals, and here insist upon discontinuity, a complete break, absolute irrelevance to what precedes, can be explained only as the result of prejudice. He had rather make any sacrifice than give up his faith in the adequacy of the mechanical method of reading the facts. If we would be fair, must we not insist that human nature, with the ideals which it brings to light, reveals truly and fundamentally the drift of nature? If we make nature responsible for evolution, then we must at any rate give nature full credit. We must keep in mind that thought, right, and beauty are as much expressions of nature as is the law of falling bodies. The whole history of evolution, including institutions, science, and art, must be somehow prefigured in the nature of the universe as a whole. The after-form which we read in retrospect must somehow be foreshadowed in the process which terminates in it and which makes such reading possible. Consciousness but reveals, it does not make the categories which guide mind in its higher activity.

Thus both the mechanical and the teleological categories must run through the various stages of evolution, however different their concrete richness and significance become with the varying complexity of the process. And this may be true irrespective of the stuff in which these categories express themselves. We have material mechanism and spiritual mechanism; and why not material teleology as well as spiritual teleology, — just as the genius of the artist may express his meaning in marble, on canvas, in tones, or by means of words? The body is different, the limitations which the material sets are different, but the ideal laws are the same.

If we take even the categories of mechanism, we are most familiar with those which are expressed in terms of our own mental life, for memory and habit are categories of mechanism. As in the mechanical categories we can trace the identity between the higher processes of memory association and the lower processes of perceptual habit and automatic activities, so we can trace the identity of the categories of external mental coherence with the categories of external coherence in the non-conscious world. Whether we use the term habit or some other term to indicate this universality of mechanism is a matter of convenience. If we cannot surely say, with C. S. Peirce, that matter is "mind hide-bound with habit," we can say that mechanism, in the sense of external determination, overlaps mind and matter, and has essentially the same categories in each.

On the analogy of memory, or rather by the use of categories which we must regard as identical and which are applicable both to the mechanism of memory and to the simpler forms of mechanism, we can account for, or at any rate throw light upon, processes which at first seem mysterious enough. In the case of memory, each part has by its position a certain function whereby it brings into the field of consciousness certain other parts. In other words, the memory mechanism is a constellation of mutually determining parts, each able to restore other parts within the cluster. The mechanism is not absolute; there are minor fluctuations even in reproductive imagination; while the situations are sufficiently identical for recognition with its feeling of familiarity, new details have been added, old details dropped out, and the tone of the situation may be greatly changed. In practical life we pass over these fluctuations as of no consequence to the process. In productive imagination, on the other hand, new types of universals are brought to light, which become permanent parts of our ideal activity.

In spite of the greater complexity of the process in the higher stages and the consciousness which accompanies it there, it is easy to see the fundamental identity of the operation of nature here with those operations which we find in the lower stages, such as heredity and the restitution (within greater or smaller limits) of parts. In each of these cases we have to do, whether in a material or a mental way, with the positional value of a part within a constellation and its power to restore its context, whether this context be the space context of a pattern of parts, simultaneously and mutually supplementing one another, or a time context, where the parts blend into one another and constitute a sequential whole, as in the stages in the life of an organism or the movement of a melody. Some writers have called this positional potentiality of parts, on the level of unconscious life, organic memory. It is truer, however, to regard memory as a highly specialized form of the more universal tendency of reproduction of parts, with their fluctuations or mutations.

Thus it seems that certain mechanical categories are common to our minds and to the rest of reality. The preservation of a type, the tendency of one part to restore the rest of its complex, seem to be common to the mechanism of the ideal stage and to that of lower activity. On the teleological side, too, we have reason to believe that there must be similar identity, — elementary formal categories running through the process as a whole, whether inorganic, organic, or ideal selection, — not limited to mind but present in some way, however unconscious, in the lower stages. There seems to be a tendency toward clearness and distinctness, toward economy in relationships. That is why the fundamental postulate of simplicity has proved so convenient both in our theoretical and practical adjustments to our world.

That nature has, as it were, an æsthetic sense, that it operates so as to produce clearness and distinctness, is shown throughout its whole range of development. The inorganic world, as well as the organic, seems to respond to our ideal demands for simple formulations, for distinct types. Physical harmony follows the simplest ratios, as was pointed out by Helmholtz. The light rays move in straight lines, the chemical elements seem to fall into a "natural series," with relations that can be mathematically predicted. In the organic world nature likewise demands clearness and distinctness; the protean fluctuations fail to survive. Only the mutations, the distinct types, continue in heredity. Again, the mixture of species either gives rise to no offspring or produces sterility; or in the case of more approximate species a final reversion to the original type takes place in accordance with Mendel's law. Finally, in ideal creativeness and psychological heredity clearness and distinctness is the law. Here our conscious aim is to eliminate the irrelevant and make the type, or universal, stand out. Only the clear and distinct types succeed in becoming a permanent part of individual memory and social history. The infinite minor fluctuations come and go. We may therefore assume that the law which nature manifests in its highest creativeness, and of which we are aware in our ideal production, namely, the law of clearness and distinctness, is identical with the law which governs nature throughout its various stages, and that the highest manifestations of this law differ from the lower primarily in the freedom and spontaneity with which the law realizes itself in the former. An immanent form in any case leads nature onward. While the law becomes conscious in the higher stages, it does not follow that it originates there. On the contrary, it comes to our creative activity as a presupposition or command, as the voice of the universe.

This demand for clearness and distinctness in nature is seen even where there is mutation and instability. In a universal process the demand for clearness and distinctness necessarily presents an infinite problem. In the case of the radio-active elements we seem to have such a case of mutation and instability in the natural series of elements. In the organic series periods of stability seem to alternate with periods of mutation. But in each case the spontaneity of nature illustrates the law or tendency which nature is ever striving to realize, and which is shown all the more strikingly because in places the process is still open and is striving for a new equilibrium.

Science, therefore, even of the most naturalistic kind postulates more than it knows, more than the blind mechanism with which it professes to work. It posits by its own faith and persistent effort, as it verifies by its success, that the universe must lend itself to ideals of simplicity and unity, that those laws which we discover for ourselves in the higher creative activities are relevant to our world, in brief that in a large sense the universe is fundamentally teleological. For us thus to strive to conquer the universe is part of the universe. The imperishable faith on the part of this piece of animated clay that, in spite of seeming defeat, it can yet make its demands prevail, that our will can in a measure reconstruct a world which shall be clear and distinct in its relationships in spite of seeming chaos, — this faith is evidence of the voice of the universe, of its push toward ideal realization. By virtue of this, "hope springs eternal in the human breast." This faith is more fundamentally pious than our short cuts by way of an anthropomorphic God. The trouble with so much of our thinking both of the mechanical and teleological type is that it has been truncated. It lacks thoroughness.

Geometry, mathematical simplification, is but this faith in clearness and distinctness reduced to its ultimate terms. It is the idealizing process in the abstract, outstripping as it comes to consciousness in us, its concrete limitations. And so form appears as limit to our finite experience; yet, when you bring back this faith to our motley world, how convenient it proves, how well our world lends itself to it, irrespective of variety of stuff, so as to make it seem that the universe "geometrizes." And in a deep sense it does; for both the seemingly opaque world we strive to know and our thought are part and parcel of one process; in their formal presuppositions they are one. Nature owns and molds mind into its own requirements. If the process in the universe, from the stellar movements and the minute relations in the structure of things to the harmonic relations of music, seeks geometrical and arithmetical patterns, this is not because our thinking regulates the process, but because in the laws of our thinking we discover the pure manifestations of the inherent form, not obscured by the concrete transitions and changes of process.

That, again, our conceptualizing should prove approximate is inevitable in a moving world. In such a world form must ever manifest itself as tendency or direction, — as an ought. Absolute our ideal formulations could only prove in a world which had completely settled or encrusted itself. But such a universe would be dead. Process, transmutation, creativeness, is of the nature of reality and must be accepted as such. That nature is creative and not merely reproductive of ready-made universals is shown both on the plane of the unconscious origination of the lower levels of nature and on the plane of ideal creativeness. Organically, nature is ever creating and fixing new types; and in our ideal constructions this is no less true. If, on the organic level, nature is prodigal in her experiment, she is no less prodigal on the ideal level. How few poems, pictures, laws, practical plans, out of the myriads evolved, answer the permanent ideal demands of the race!

If nature stands in relation to its processes as an artist attempting to express a form — a form not foreign to itself but its own implicit or explicit constitution — then we must regard natural selection as part of the same activity, differing only in the degree of conscious direction and significance. The latter is itself a result of the demand for clearness and distinctness of functioning on the part of nature. In natural selection this formal demand realizes itself automatically in the flux of process. Just as the stone rolls back again to the bottom unless it reaches the top of the hill, so life tumbles back to the inchoate plane from which it has tried to rise unless it reaches a clear and distinct type. On the level of thought, however, where nature is more or less clearly conscious of her aim, the process of so-called "artificial" selection is far more economical and efficient. Not only can ages of unconscious experimenting be foreshortened, but results of clearness and distinctness can be attained which blind groping never could reach. And with it all, there is added the consciousness of value with its infinite richness.

It is not a case of natural laws in the spiritual world or of spiritual laws in the natural world, but of certain laws prevailing throughout the process of the universe, expressing themselves in the limitations of each particular stage and stuff in which they operate, just as the categories of art are fundamentally the same whether the stuff be marble, tone, or the body of language. What makes the law in each case clear is the interpenetration of the same identical form. The various energies are fundamentally run through with the same categories. It is a case of our reasonable reading of our world.

We are now in a position to sum up the internal conditions governing the continuity of process. For the present purpose, the elementary facts in the constitution of process may be considered as three: (1) the fluency of process which makes it overflow our abstract types, producing ever new fluctuations and mutations; (2) the mechanical aspect of process which makes its flow crystallize provisionally at least into certain structures, making it possible to predict and control its flow; (3) the formal requirements which condition the direction and intelligibility of the process.

Two questions yet remain, namely, the character of this formal constitution and the question of its effectiveness in our world of process. Coming back to our first question, How do forms preëxist or what forms are presupposed? I do not believe that it is necessary to assume an indefinite number of forms as do Plato and Aristotle. True, Aristotle limited the forms to class-forms and depended upon the concrete process to differentiate these into individuals. I would make the formal requirements still more general — the same for the process as a whole. These formal requirements, as I have shown, can be reduced in the last analysis to the demand for clearness and distinctness as regards the transitions and relations within the process. Variations, smaller or larger, are ever produced; they tend to crystallize — to be retained and to reproduce their contents by virtue of the inherent mechanism of the process. But they survive in the process, so far as internal conditions are concerned, only if they fulfill the formal requirements of clearness and distinctness. Neither the types nor the individuals are predetermined as such. But when in the course of the transmutations they do arise, they must, in order to survive, obey certain formal laws — laws which are also fundamental in our understanding and appreciation of our world.

Of course, besides the internal conditions of survival there are the external conditions, which fix what types can survive in the particular environment, simple or complex, low or high, as it may be. But these can only eliminate, they cannot make types permanent.

These external conditions cannot be conceived in merely material terms. There is more than one level of environment. If we take into account merely the simplest environment, the micro-organisms are better adapted to it than we are. They were here before us, and will remain for ages after the earth becomes uninhabitable for the higher forms of life. Some of them are adapted to withstand the temperature of liquid air.

There seem to be certain plateaus, levels, or crusts of life, more or less rhythmically formed. These have their own unique conditions for survival. In social life we have certain levels in the way of custom and tradition; then there comes a loosening of the crust and a period of agitation and rearrangement. This in turn is followed by a new level of equilibrium with new selective conditions for the individual. The same seems to be true of life on the organic level. Here, too, periods of stability of species are found to alternate with periods of mutation. And thus new levels are reached with new external conditions for survival.

As regards the effectivenes of form, Plato and Aristotle have shown that in higher ideal realization it is not necessary that the form itself should move in order to produce movement, that is, that the form should possess energy. The beloved may be indifferent to the lover. Beauty moves us by its perfection, not by its sensuous body. What is true in the higher activities may be true of the lower. Substituting energy or tendency for love, we may say that energy seeks a geometrical or arithmetrical pattern, seeks simplicity of relationships, though the formal limits which it seeks do not act upon it. They are in fact part of its constitution. The laws of logic do not act upon the process of thought. They are implied in it. And thought is but nature's reflection upon itself.

III. *Matter and God*

In closing, something must be said about the metaphysical nature of the world in which form is realized. There has been in recent times much sentimental inveighing against the mean-ness and blindness of matter. Now that depends primarily upon definition. With some noble, rugged materialists the conception of matter is decidedly thick — rich in possibilities. Democritus, Hobbes, and Priestley deny nothing to matter that could make the world plausible. They attribute to matter all the pragmatic consequences with which experience makes us acquainted, including mind and ideals. With Democritus, while mind is reduced to fire-atoms, it loses nothing of its efficacy and dignity on that account. For Hobbes, consciousness itself is a property of matter and so not foreign to the world. Priestley's materialistic hypothesis does not interfere with his religious devoutness. The great prophets of Israel, who gave us our fundamental ethical and religious ideals, thought of the world, including the human soul, — "the breath" of man, — in material terms. With all these, matter covers the whole range of potentialities from inorganic nature to a deistic God. Tyndall could not cease to marvel at the potentialities of matter. When we should understand them, all would be clear. With this thick conception of matter, teleological idealism need not have any quarrel. Matter rises to any emergency since the conception can be enlarged to meet the case. It would be principally a question of convenience whether we should use such a concept.

The tendency, however, has not been absent to narrow the conception of matter to the anti-teleological, or mechanical, interest, and thus to contrast matter with mind, — which under such a view becomes a sort of miraculous accident. Such a conception still leaves much to admire. The body with its delicate adjustments and intricacies shows wondrous possibilities even when contrasted with mind. Even the pale nobility of the face of a dead friend challenges our reverence by its wonderful expressiveness. The trouble with the mechanical conception is not so much its ignobility as its narrowness — its failure to take stock of all the facts, to furnish play for all the possibilities of life.

If we use matter in this narrower sense, as opposed to mind, what is the function of matter in the process of evolution? Those who have attempted to give an account of the world in terms of monistic idealism, in whatever form, have eventually been brought face to face with the problem of that upon which the mind impinges, the non-teleological stuff against which our purposes seem to beat, and in struggling with which they discover themselves. If Plato insists that only the Good is ultimately real, and all else is imitation and non-being, yet he has to recognize a reality at least in the limitations which the struggling elements of our mundane sphere set to our purposive striving. If the elements but reflect the universal beauty, they also distort it. If Aristotle finds in matter the potential, yet it is not passively potential. It has an order of its own which may run counter to the purposive order. The Platonic dualism meets us again in Hegel's spatializing of the category of spirit and its estrangement in its lapse to unconscious otherness. As Aristotle's potential, it meets us in Fichte's struggle of the ego with the irrational surd of our nature, while Schelling would make the physical energies merely lower categories in the history of spirit as it struggles toward its conscious awakening. Bergson would make matter the inverse of reality — the intellectual spatializing and degradation of a reality which is essentially a psychic stream of growing, blending, interpenetrating life-impulses. But, nevertheless, he has to acknowledge that somehow in the struggle with matter, in order to mold itself to its constitution, to maintain itself under its conditions, life explodes like a shell into its inherent tendencies. In some sense, then, the reality of matter, as having a part in the realization of life, has had to be recognized even by those who have categorically declared its non-existence.

In giving an adequate account of mechanical matter as an external condition and instrument in the evolution of life, a pluralistic conception of the world has a decided advantage over the monistic. It is not forced to smuggle in through the back door what it has cast out through the front door. It is free to follow the lead of experience in recognizing different types of reality. Among these are the physical types which, on the one hand, through their own structure and laws set definite conditions for the survival of life, and, on the other hand, furnish the intellect with the instruments by which life becomes liberated from slavery to the immediate present.

Even in dealing with the physical world, where mechanical conceptions have so long reigned supreme in our theorizing, it has become more and more clear that mechanism alone, convenient as it is within certain limits, is inadequate as a final philosophy. So far as the naturalistic aspect of the world is concerned, it would seem that the available energy must continually run down as the streams run into the sea; that heat must reach more and more a condition of equal distribution according to Carnot's law, and that the universe must become eventually stark still, or rather would have had to become so infinite ages ago. That this law has not thus operated must be due to the fact that mechanism is somehow a part of a larger constitution which is fundamentally teleological and in which life and mind are fundamental categories. Even to explain the activities of matter, we find it convenient to think of it as somehow interpenetrated by intelligence; Maxwell's sorting omniscience keeps the universe from running down to a dead level. And Professor Henderson [1] has recently shown that it is improbable that the ensemble of maximal properties which constitute the environment of life should have been produced by mere chance. It is more congenial to our mind, at any rate, to assume prospective intelligent selection within the physical environment, fitting it for the abode of life.

On the other hand, I cannot feel that merely reducing the universe to metaphysical mind-stuff, as in the various types of panpsychism, necessarily ennobles life. Because metaphysical idealism has seemed to furnish a congenial climate for our ideal striving, we have often been inclined to overlook its logical fallacies, its violation of common sense, the bankruptcy of its ethics, the romanticism of its procedure. Few have understood its technical terminology. But they have accepted it emotionally, nevertheless, as a poem, a religion. Add to this that many champions of absolute idealism, such as Fichte and the Anglo-American idealists, have themselves been noble and inspiring souls, whose emphasis has been on value rather than stuff, and you have the reason for the recent vogue of panpsychism. But the world is neither better nor worse for our metaphysical conceptions. And if panpsychism is indifferent to the realization of ideals, if it reduces the higher to the lower categories, if it fails to give us a preferential basis of values, if it offers no call to our creative capacities, it is teleologically indistinguishable from the crassest type of materialism. This is the logic of the fact that so many Hegelians of the Left completely faced about from absolute idealism to absolute materialism, or rather found that the former, as impersonally conceived, was equivalent to the latter. The mere reduction of the stuff of the universe to the type of mind-stuff is not sufficient to guarantee its value. The lowest things, as well as the highest, that we know in our experience are mental. The most degrading lusts are as much mental as the highest aspirations. Mind covers the whole range of value from heaven to hell.

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[1] "The Fitness of the Environment" (Macmillan, 1912).

The pragmatic difference in metaphysical conceptions for our ideals lies not in the stuff of our conceptions but in their friendliness to what we feel to be our higher nature, the reenforcement of what we feel to be the best part of the universe, our ideal demands.

We must not be misled by mere words. We must recognize that pragmatically we have dynamic situations with their variations and their tendency toward types, whatever the metaphysical stuff may be. It is a mistake to suppose that by adopting more euphonious terms for these situations, such as "vital impulse" or "panpsychism," we have either explained or dignified the process. As general metaphysical entities they do not alter the problem of continuity and evolution one whit, though they may be more congenial to our imagination. The problem in any case remains for science to discover for our practical purposes of description and prediction the determining factors in the process; and for philosophy and religion to discover the immanent categories which enable us to read the process with clearness and distinctness. We must conceive a world which makes our minds feel at home. Teleologically, it makes no difference whether we call the universe matter or spirit, if we only realize that it is such as eventually to demand and enforce ideals. This is its ultimate promise or potentiality. What name we give to reality does not matter so long as its properties, its pragmatic outcomes, are the same; so long as it can think and appreciate and furnish the object of our hopes; so long as it blossoms out into a sense for beauty, a demand for right, a worship of the ideal. It is true in any case that the universe makes us for itself, to express itself.

Our direct acquaintance with the effectiveness of form is limited to the operation of mind and to this in its higher ideal striving. When we try to realize formal selection in the universe at large, it is at any rate easier to picture such selection to ourselves if we think of a greater and better mind interpenetrating the various stages of the process with intelligent interest, reënforcing the formal demands of the process and eliminating failures.

Even if the conception of an abstract, immanent form should satisfy our purely logical and æsthetic demands upon the universe, our ethical and religious needs would still call for an interpenetrating and overarching personal constitution which works for righteousness and beauty, which is sympathetically concerned in ideal realization, which in short makes warm and living the formal constitution of the process. We think of God as the master-mind, interpenetrating our minds and nature and, in a manner which we can but faintly grasp, guiding to a meaningful issue.

To be omnipresent and universally effective, this mind need not be the whole of things. Heat and gravitation are present throughout the physical world, but they are not the whole of the world. Take social history, — a great personality like Jesus may permeate history and make it converge toward him, may stamp and control history, and yet not be all of history.

Of this large regulative and compensating universal constitution it must indeed seem that it does a wholesale rather than a retail business. This would indeed be deadening to our ethical and religious consciousness, except for the other analogy derived from our own organic economy, namely, that the regular adjustments become automatically purposive. So the wholesale operations of the universe require no attention. Maxwell's sorting demon can do his work automatically. Mechanism can take over the work of intelligence. It is only the retail unique relations which require interest. This leaves mind, in its higher reaches, free to deal with the rarer personal aspects of the situation, the spots where, by virtue of spontaneity and complexity, free and rational creativeness operates. And if even here personal interest or sympathy seems appalling, we must remember that the Mind of minds is not bounded by our narrow limitations of space and time, but is capable of an infinitely larger field of interest. We may also imagine that the occasions for sharing in this larger life lie in us — this suprafinite life lying ever at our subliminal or supraliminal door, ever waiting, and ever welcoming the proper organization and the due awakening in us for its powers to be realized, as light awaits the organization of an eye for its beauty of color to appear. Thus pluralism, and pluralism alone, with its conception of growth and organization of centers and their mutual and cosmic interpenetration, fills the need of the religious demands of life.

As, moreover, our finite minds can interpenetrate and mold various types of stuff into the unity of ideals, so the Master mind may interpenetrate the variety of the processes of nature, even though they are not mind. The statue can express ideals even if it is not mind-stuff. We may thus have teleological unity with variety of stuff and stages of development. We may in closing adopt the language of Emerson, even though we must conceive our relation to the Master mind as more concrete and intimate than that implied in the Oversoul: "We live in succession, in division, in particles. Meantime within man is the soul of the whole, the wise silence, the universal beauty to which every part and particle is related, the eternal one."

CHAPTER XIX

General Survey: The Five Attributes

The problem of attributes is somewhat out of fashion since the dominance of modern idealism. It has become a habit to think of reality simply in terms of experience, and reflective experience at that. It seems to me, however, that with our new epistemological tools we are in a position to take up seriously some of our old metaphysical problems, applying the pragmatic method. In using the term pragmatic, I do not mean to commit myself to any of the special doctrines which have recently passed under that name. I mean that any reality must be conceived as the differences it makes to our reflective purposes. This holds whether the reality in question be of the thing type or the self type or some other type.

I

Substance has come to have a distinct scientific meaning in modern times. So far as it is possible to revive the Spinozistic conception of substance, it would now amount to the epistemological postulate of totality, viz. the facts are part of one world in such a way that every fact can, under certain conditions, make a difference to other facts.[1] What those conditions are, it is for science to investigate. The differences must also be capable of becoming differences to a reflective consciousness under certain conditions, in order to concern us.

These differences are capable of being systematized into certain attributes — *summa genera* of differences not further reducible. My reflections have led me to believe that there are five such attributes, irreducible to terms of each other, viz. stuff or energy, time, space, consciousness, and form. Future investigations will have to determine how far these are ultimate attributes and whether there are others.

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[1] See "Truth and Reality," Chapter VII, pp. 133–138.

It is true that such attributes are abstractions from the total matrix of reality. But to say that they are abstractions does not mean that they are ideal or phenonemal in the sense that they belie reality. Without abstraction we can have no science of reality. These attributes are genuine aspects of reality if we must recognize them as such in the procedure of experience.

The classical discussion of attributes goes back to Spinoza. Spinoza makes causal difference, as well as conceptual, depend upon the possession of a common attribute on the part of the contents. He even goes farther and reduces the causal relation to the conceptual: "If things have nothing in common, it follows that one cannot be apprehended by means of the other and, therefore, cannot be the cause of the other."[1] This evidently is a confusion of causal dependence with logical dependence — a confusion of which later idealism has so often been guilty. With Spinoza this identification easily follows from the ambiguity of his parallel attributes, as we shall see later.

The same reality, according to Spinoza, figures in different attributes. Thus substance must figure as both thought and extension. It must also figure in infinite other ways not included in experience. Thus substance must possess not only all the attributes of which there is evidence, but infinite others. The more reality, the more determinations. Hence, complete reality must have infinite determinations.

It is not necessary to point out that Spinoza is inconsistent with his own thesis, that every fact within reality must be conceived with reference to a context, or, as he would put it, must have a common attribute with the rest of reality. He is inconsistent, first, as regards the relation between thought and extension, for extension must be conceived, and so must be capable of making a difference to thought. To be indifferent or parallel to thought would be to be without significance. He is still more inconsistent as regards his infinite attributes. These, by hypothesis, make no difference to thought, and yet are assumed. On the contrary, in so far as we make an *a priori* assumption, we must start with a finite number of attributes. Else knowledge becomes impossible. As a matter of fact, we have a right to assume only as many attributes as make a difference to judging or reflective experience. The question whether these are altered by being known can have no meaning, since it is only for reflective experience that attributes have significance. We must assume that the attributes are what they are consistently known-as in progressive human conduct.

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[1] Spinoza, "Ethics," Part I, Prop. iii.

It is unnecessary to point out that extension, with the geometrical qualities it implies in Spinoza, cannot be made an independent attribute apart from the energetic context in which a thing figures, including our perceptual organic context. Extension is as much a quality as is color or tone. To be sure the quality of extension may be said to exist in contexts independent of experience. But extension, to be known at any rate, must figure in the context of our perceptual consciousness. And if so it cannot be parallel to experience in Spinoza's sense of forming an exclusive and complete world of its own.

Spinoza himself was far from consistent in the relative emphasis he put upon the two attributes. When he dealt with the problem of knowledge, he was inclined to regard mind as the mere consciousness of the actions of the body — *idea corporis*. He at least came dangerously near being a materialistic realist. As he puts it: "The object of the idea constituting the human mind is the body, and the body as it actually exists."[1] And again: "The human mind is the very idea or knowledge of the human body."[2] No wonder then that "the order and connection of ideas is the same as the order and connection of things,"[3] or as he puts it elsewhere, "as the order and connection of causes."[4] It follows, also, that his theory of association must be strictly physiological: "Memory is simply a certain association of ideas involving the nature of things outside the human body, which association arises in the mind according to the order and association of the modifications of the human body."[5] This materialistic tendency is seen also in his physiological theory of emotions: "Whatsoever increases or diminishes, helps or hinders the power of activity in our body, the idea thereof increases or diminishes, helps or hinders the power of thought in our mind."[6] It follows, on this view, that our knowing the object does not in any wise alter the object, though our ideas may be inadequate, fragmentary or confused. Such privation of knowledge is falsity. Knowledge, when clear and distinct, takes account of the object as it really is in its own eternal system of relations which Spinoza calls God. Materialistic realists of to-day have repeated both the theory and inconsistency of Spinoza, for while holding that mind is just the awareness of the body, he finds it hard to rule out mental facts as such with their own unique relations.

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[1] Part II, Prop. xiii.

[2] Part II, Prop. xix.

[3] Part II, Prop. vii.

[4] Part II, Prop. xix.

[5] Part II, Prop. xviii, note.

[6] Part III, Prop. xi.

What blinded Spinoza to his epistemological materialism was doubtless his play on words. Thus he argues, as we have seen, that mind is the consciousness of the body. But he argues further that "this idea of the mind is united to the mind in the same way as the mind is united to the body."[1] He thus, after telling us that "the object of our mind is the body as it exists, and nothing else," substantializes this *idea* of the body as having a "distinctive quality"[2] of its own. This process can then be repeated on the idea of the idea, etc., *ad infinitum*. But the fact is that there is no new content provided for in this repetition. It is purely a trick of language. We remain where we started, with mind as the consciousness of the bodily modifications. That we know that we know, in any case, only signifies that the attitude of knowing brings its characteristic feeling of belief with it, in so far as it is successful.

When Spinoza, on the other hand, turns to the problem of conduct, he becomes as idealistic as he is materialistic in his epistemology. He attributes all agency to systematic thought and the passive becomes synonymous with the confused and unreal. For in the case of ethical conduct, cause no longer means physiological processes, but clear and distinct ideas. Our mind is active "in so far as it has adequate ideas."[3] "The passive states of the mind depend solely on inadequate ideas."[4] And man can be said "to act in obedience to virtue" only "in so far as he is determined for the action because he understands." Finally, the mind's highest knowledge and highest virtue is to know God. And to know God is to love God and to love him with "that very love whereby God loves himself,"[1] "wherein our salvation or blessedness or freedom consists."

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[1] Spinoza, "Ethics," Part II, Prop. xxi.

[2] Part II, Prop. xxi, note.

[3] Part III, Prop. i.

[4] Part III, Prop. iii.

Thus Spinoza halts between divided motives. In epistemology he tries, in opposition to the occasionalists with their miraculous correspondence between the physical world and the mental world, to simplify his problem by making physical objects with their relations the only real contents and agencies, while mind is reduced to a mere spectator. In ethics he saves the significance of conduct by making mind as reason or "clear and distinct ideas," the real agent. The world of impulse and sense becomes the world of passivity. He is thus at the same time, though for different purposes, an epistemological materialist and an ethical idealist. Spinoza's logic, in either case, leaves us only one attribute — one complete system whether of matter or thought.

Modern science, in so far as it has been allowed to pursue its own task, unhampered by metaphysical suppositions, whether of the materialistic or idealistic sort, has always insisted upon as many attributes or independent variables as the facts seem to require. These seem to be three for natural science: space, time, and energy. The conception of energy has gradually supplanted the conception of matter as a universal ideal of description. Matter is applicable only within a limited field. It is not applicable, for example, to electricity; while energy with its equivalences of transformation can be made to cover the whole extent of process, material and immaterial, physical and psychological.

In spite of the fact that natural science has found it necessary to work with these three attributes, it has failed to define them in any clear way. The desire for simplification has always made itself felt. Thus space and time have sometimes been regarded as pure quantity. But if space and time are pure quantity, how can they be given distinct meaning? We must look for the differentia of these attributes, as they are in fact implied in our attitudes to the world of processes with which science deals. Not the serial tools which they have in common, but their specific character, is what we must try to make clear. Certainly, as pure quantity, time and space are indistinguishable from each other and from quantity in general. While it is convenient to reduce time and space to pure quantity for certain artificial purposes of prediction, this should not blind us to their true character in the world which we intend thus to simplify.

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[1] Part V, Prop. xxxvi.

Not only has the attempt been made to reduce time and space to pure quantity, but the same attempt has been made in regard to mass. Thus Karl Pearson would reduce mass to acceleration. But if mass and energy are pure quantity how can we get the different units with which quantity must deal? These units, obviously, mean something different, according as we are concerned with chemical elements or electric potentials or neural reactions. But this only shows the confusion that has been too prevalent in the analysis of scientific concepts.

Moreover, while natural science, in its task of simplifying and anticipating the world of perception, has been forced to emphasize the above attributes, there are other attributes which, though neglected, are nevertheless implied in the whole procedure of natural science. Thus the attribute of consciousness — the condition of the unique relation to mind of being experienced or interesting, in short the awareness of a world, with its complexity — has been neglected by the natural scientist. This is natural inasmuch as this attribute is equally present to the whole field of problems with which he deals, and, therefore, for his specific purpose can be neglected. He has set himself the task of dealing with a specific part of experience, not with experience as such.

Again natural science assumes that its facts can be formulated into a system, *i.e.* that they can be explained in terms of a finite number of simple principles. It implies the reality of logical form or that the laws of thought are also the laws of things. This obviously is not deducible from the attributes of space, time, and energy, but is a presupposition or ideal which is implied in all our cognitive endeavor. It holds at any rate in the part of the universe which is molded by our will; and if science is to be possible, this presupposition must hold in the universe at large.

II

It must be obvious, from this survey of the results of the past, what our problem is. And while the inquiry did not start from the assumptions of science, it must be a matter of more than curious coincidence that the metaphysical needs and the scientific needs point in the same direction, even though the former set a much more comprehensive and articulate program. Applying the pragmatic criterion, that we must assume only such realities as can make differences to our reflective procedure, we must try to make clear what are the ultimate types of differences which reality makes to our reflective conduct, or, expressed in subjective terms, what ways of taking or evaluating our world prove finally effective in our understanding and appreciation of it. Such types of differences we shall call by the classic name of attributes. I shall now try, in brief, to define these attributes — the *summa genera* in the reflective evaluation of the character of our world.

Being

First a word about the attribute of "being," as it has been called since Parmenides. By "being" we mean the stuff character of reality. This stuff is capable of making definite differences under statable conditions to other stuff. This dynamic continuity of stuff, with its equivalences, we call energy. The stuff that has been emphasized by modern idealism is meaning stuff — our reflective purposes. These constitute one type of stuff, and must be taken account of as of final importance for our appreciating and understanding of the world. They enable us to differentiate the processes and spread them out in series. Similarity, difference, causality, reciprocity, etc., as general categories or modes of functioning must be part of this account of stuff.

In order to make a difference to experience, reality need not necessarily be reflective. On the contrary, reflective experience will be seen to be dependent to a large extent upon non-reflective processes. The meaning of the object reflected upon depends largely upon its unnoticed background. There are three ways in which attention may be dependent upon unnoticed facts. Thus processes, not attended to, make up the larger associative context, the background of feeling and tendency, of the object. The different meaning of man or evolution to the scientist and to the common man is largely in the "fringe." Or the unnoticed may be instrumental to the activity of attention without itself being attended to. For example, the words on the page that we read. We have a different consciousness when we are attending to the meaning of the words from what we have when we make the words themselves the object. There may be processes, however, which are entirely irrelevant to the purposive consciousness of the moment, as well as unnoticed by it. Thus the pressure of our clothes, the furniture of the room, the temperature, etc., even though not attended to, make a difference to our consciousness which we can easily see by an alteration of these processes. We have a very different consciousness in reading a book out of doors under the open sky from what we have in reading the same book in our own study, though in either case we may not be attending to the setting. If we want one name for all these various unnoticed mental processes I would suggest subattentive,[1] instead of subconscious, which at best is misleading.

Not only are there mental processes beyond the circle of reflective thought and making a difference to it; there are also processes which we cannot speak of as conscious experience at all, which still make a difference to our reflective meaning. That I can take up to-day the problems of yesterday or last year and thus connect again with my own past, seems to be dependent upon a continuity of processes which are not themselves conscious. The unity of the passing thought can account for the continuity of our consciousness only while we are conscious. It cannot bridge over the gap between going to sleep and waking up again, or account for the bringing back of experiences which have not been active in the meantime. What these processes are in their own character must be determined by science according to its convenience. It must simplify them and differentiate them according to our needs in meeting the complexity of our world. Mere *a priori* classification can count for nothing.

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[1] This term was suggested in an article in the *Jour. Phil. Psychol. and Sci. Meth.*, 1907. It has later been advocated by Dr. Marshall in the same journal, but the term subconscious seems to have come to stay.

One thing is certain, and that is the close relation between what we call physical energy and our mental activities. It is a commonplace that a cup of hot coffee may change our emotional atitude towards the world. But I suppose we would not on that account be guilty of speaking of coffee as emotion stuff. Psychotherapy, again, has made us familiar with the differences that mental processes can make to the physiological. We have gotten over the notion that one process in order to make a difference to another must be of the same kind. Chemical energy is not the same as electrical, though capable of making differences to it. So different are the conceptual tools which we need in each case that electrical energy is sometimes spoken of as immaterial. This, I take it, only signifies that the conception of gravitation mass is inapplicable. The difficulty of finding a common denominator between psychic processes and physiological seems still greater, yet they are clearly interdependent. All we can hope to do in science, and science must here be our last word, is to show definitely the conditions under which the transformations take place. The following of the minute internal transitions may forever lie beyond us.

Looking at the stuff character with reference to the implications of the reflective moment, we have found it convenient to look at it as of three levels. These levels can be seen in a cross section, as it were, of every reflective moment, the reflective consciousness showing its dependence upon marginal or unnoticed experience and this again upon processes to which the category of experience cannot be ascribed, and which we speak of as dispositions.

Stuff has the advantage that it can be observed directly. It is an object of immediate perception and judgment. The other attributes of which we shall speak, viz. space, time, consciousness and form can only be observed or make a difference to our judgment through the difference they make to the stuff structure of the world, including our own purposes.

I shall speak of these attributes as non-being attributes, not because they are less real, but because they are not statable as stuff. In the language of philosophy the stuff character has appropriated the term, "being." These non-being attributes can be defined or differentiated from each other by the difference which they make to the active purposes of the self.

Time

It has been customary since Kant to deal with the time and space attributes as series and therefore to insist upon their ideal character. I have insisted, on the other hand, that the serial character is relative, and that the real *differentia* of these concepts must be found in characters of reality which are not themselves serial, but furnish the *rationale* of the serial construction. If you speak of time and space, for example, as pure quantity, there remains, as we have already pointed out, the problem of stating the relation of time and space to the general concept of quantity, on the one hand, and to show their differentia with reference to each other, on the other hand; that is, the whole problem of definition remains. In what, in other words, lies the difference in our purposive attitude in evaluating space and time?

To speak first of time. What difference does time make to the realization of our purposes? Energy, we have seen, stands for constancy of process — for stable types of prediction. And there is a degree of constancy or we could not have science. But, on the other hand, it is a characteristic of our concrete world that it does not stay put. We must recognize fleetingness — growth and decay in much of reality. Constancy, in our practical experience, seems at best relative. Hence, we must predicate the attribute of time. It is precisely because the universe is in perpetual flux, that the task of science — the singling out of certain relevant identities which enable us to find our way amidst the ever novel and different — becomes so significant. In the frozen block-world of Parmenides we should have no need of science. The constancy aspect is limited by the flux aspect. And while we must recognize the former as real, it seems but meager in extent beside the flowing world of protean detail.

While, again, it is convenient, for certain abstract purposes of description, to reduce time to quantity, this must not blind us to the nature of the processes which we intend and from whose essential character we have abstracted for the partial purpose. I insist that what we mean by the differences time makes to our purposes is not statable as mere *units* of chronology — the intervals of the clock. There must be flow, movement, or we would not go to the trouble of inventing units. This movement, even in the measurement of time, ever belies our static definitions.[1] Suppose that nothing really happened — no running down of energy, no being born or growing old, no change in values. In such a world we should indeed declare time to be no more, to make no real difference. Or rather we should have no concept of time at all. What makes time real to us is that it necessitates new judgments, whether because of transformation and novelty in the purposive meaning which evaluates or in the object which is evaluated. So long as this is the case we cannot express reality in merely static categories. Our quantitative devices are instruments to adjust ourselves to this concrete flow.

It matters not, for this purpose, how you ultimately conceive the stuff of the world. You may conceive the process as the rearrangement of physical entities. Even then you must have something besides the bits and their position to account for the process of the perceptual world. I do not see, myself, how the bits can be indifferent to the rearrangement they must suffer, except as they are recognized as merely our conceptual models. But whether you conceive the stuff of reality in the last analysis as atoms and electrons or as purposive systems of meanings, the question remains: When you have thus conceived reality, why should it slip away? Why does it not remain chained in the present, as Parmenides would say? Why should there be rearrangement, whether a running up or a running down process? As the world has no beginning, neither process can be absolute, for then the world must have run its course countless ages ago. The theory that the world tends to an equilibrium or an equal distribution of heat, as implied in Spencer's formula and the second law of thermodynamics, presupposes a finite creation of the world.

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[1] See "Time and Reality," *Psychol. Rev.* Mon. Series, no. 26, pp. 23 and 24.

If you say, again, that the present rearrangement is the result of previous rearrangement, and so on *ad infinitum*, why should there be rearrangement at all? Why should not our positional values remain fixed? Why should something creep into our equations, whether subjectively or objectively, so as to make them false? If you insist that reality remains fixed, there at least remains the appearance of rearrangement in the subject, and that is part of reality and must be met.

Given, on the other hand, time as a real character of the world, you can account for the transformation of values, the instability of positions or the falsifying of our judgments, which is what it all amounts to in the end. You can also furnish the *rationale* for our serial construction to meet such a character of the world, while you can not derive the time character from the concept of series. The construction of time infinities is a secondary affair, and can neither explain nor invalidate the real time character. We should not say that things move in time. This is putting the cart before the horse. Our serial construction is made necessary, on the other hand, because of the transformation of our facts and values. Time furnishes the limiting value of certain serial constructions, such as past and future, without which they would be meaningless.

It is inverting the real situation to speak of contents as carried over from one moment to another or as passing in and out of time. What really takes place is that some contents remain constant, others come and go. Our psychological moments chase each other and fade like the shadows on the mountains on a cloudy day, yet withal some constancy of outline — of tendency and content — remains by means of which we can realize their fading and fleeting existence. The more permanent contents furnish the background upon which the fleeting ones appear and disappear. Some of the latter observe a certain rhythm. In the case of the earth clock, and our artificial time pieces based upon it, we have socialized this rhythm, relative though this is in the end to the process. Then we use this rhythm to measure the enduring contents, with their passing or accumulating increments. Having invented intervals we can divide these at will, even to infinity.

We then invert the process and imagine that the contents run through our artificial divisions. The latter, however, have no effect on the real overlapping or change. They are an afterthought.

Space

And now a word about space. If time makes the difference of *transformation* to our concrete realities, space conditions *translation*. If time makes an intrinsic difference to our processes, space makes an external difference. The character of space, in other words, is such that it does not interfere with movement. If space offered resistance, geometry, which is based on *free mobility*,[1] would be impossible. It matters not for our purposes whether space be actually empty or not. It is convenient, for scientific and practical purposes, to posit space as a limit of exhaustion and as the absence of resistance, *i.e.* to assume a space zero. Only thus can we state Newton's first law of motion. Moreover, if we can approximate to such a limit, it must be as objectively real as though we had actually attained it.

We cannot rule out space by mere *a priori* considerations. Thought must follow the facts and not dictate to them. Whatever we must acknowledge as real cannot fail to be conceivable. And pure space seems to be more than a conceptual limit. Interstellar space seems to be practically pure. The rays of light are, so far as we know, not interfered with in any way until they strike solid bodies. Michelson's careful measurements indicate that the earth rotates as though it moved in empty space. What is true in the large may be equally true in the minute. Thus the compressibility of the atom as indicated by the experiments of T. W. Richards seems to point to space intervals in the elementary structure of the universe. Whether such observations as regards the existence of pure space prove final or not, this does not invalidate the reality of space as the condition of the energetic interactions in space.

A more positive characteristic of space than that of free mobility is that of *distance* or externality of energetic centers.

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[1] For a more complete analysis of the properties of real space, see chapter XIII, pp. 234–243.

As distance, space conditions the equations of the astronomer and the realization of our human social purposes. For even though our purposes do not occupy space, they nevertheless operate in space and space makes a difference to their realization. If from Kansas I wish to communicate with a friend across the sea, it makes a definite difference as regards the kind of communication and the sort of relations that are possible between us, that he is some thousands of miles away.

Spatial distance does not of course prevent energetic overlapping of centers. In the case of my friend it is true that my purpose to communicate may become continuous with certain physiological processes, and these in turn may become continuous with certain physical energies which in turn span the distance between me and my friend. But the overlapping is different and the realization of the social purpose is different because of the distance. No mystical monism can remedy this difference. No mere intellectual change of point of view can alter the practical situation in which space figures as one condition.

We must, of course, be careful not to confuse the real space condition with our psychological or logical perspectives with their ideal distinctness or externality of parts. *Things* cannot move in an *ideal* system. Serial space is a construction — an after-picture to symbolize the relations of things, whether physical masses or geometrical figures or self-conscious individuals, in zero space. If space were merely an ideal system, distance and free mobility would both be figurative without any reality for the figure. If we admit a real zero space, we can easily account for phenomenal or serial space, but not *vice versa*.

I grant cheerfully that all our quantitative measurements are relative. Our serial constructions, our geometrical as our chronological models, are our tools by means of which we strive to meet the actual nature of the world. But I do not see how any mere contradictions in our concepts can rid us of characters of reality which condition all our real purposes, whether as regards transformation or translation. We must penetrate beneath the apparent contradictions and revise our concepts in conformity with the reality which they mean to express. Concepts must be our servants, not our masters.

Consciousness

It is convenient to treat consciousness, the condition of awareness or interest, as a unique attribute. It is absurd to suppose that our conative attitudes and organized meanings become atoms and molecules when we are not aware of them; they change, not in stuff but in value when they are illumined for an instant by interest. Consciousness is a new character added to our conative purposes under certain conditions of intensity and readjustment. The conative purposes themselves may remain as constant as individual existence. They may even become permanent parts of social history.

Consciousness or awareness is a neutral light. It does not create distance nor does it create meaning. It may be an awareness of meaning or an awareness of sensation. In our developed experience it is both. To make such awareness possible, there must preëxist, as conditions, on the one hand, the object-context of which we become aware, and on the other hand, the system of conative tendency which forms the subjective condition of awareness. But neither the object-context nor the system of tendency is, as such, awareness. When interest is lighted, under its peculiar conditions, a new relationship to the organism originates which cannot be reduced into other existential relations such as temporal, spatial, causal, nor into logical or æsthetic relations, though these now come to have subjective value.

Consciousness thus conditions the relation of being felt. It converts what otherwise would be a type of mere interaction into contemplation. What is contemplated may be an external meaning — a proposition in Euclid. It may be an electrical shock. It may be a relation such as distance. What is thus contemplated need not be experience stuff. It includes not merely experience transition, but space transition. It may be any kind of energy or relation. On the other hand, a meaning may be as objective or external to consciousness as space. We do not make Homer's meaning or the Sistine Madonna, when we become conscious of it, any more than we make the distance from the earth to the moon when we take account of it. Consciousness in any case is a gift which for its condition presupposes on the one hand conative tendency, on the other hand the shock of a stimulus — a situation to be met whether intra- or extra-organic. A mere continuity or succession of objects is not a consciousness of continuity or succession. Awakened tendency, or interest, is also required. And then the content may come in temporally discrete pulses of experience.

Thus in being conscious there are always end-terms; and one of the end-terms must be a conative system of tendencies. The terms need not be a logical subject and object. They may be blind instinct on the one hand, and any fascinating stimulus on the other. But one of the end-terms is always conative in character. Consciousness is always an aspect of the situation which we call *interest*.

Consciousness has been confused, on the one hand, with its conditions, on the other with its species. It has, in the first case, been regarded by the materialist as a product or effect of chemico-biological causes. But the materialist himself has admitted that it is not comparable with what is ordinarily meant by effect. It is rather an epiphenomenon — a miracle added to the process, without making any causal difference to it. On the other hand, we may with the epistemological idealist regard this awareness as everywhere and always present and indissociable from the contents of reality. But here we are dealing with an assumption which seems to run counter to the facts as known in our finite experience. I prefer a third alternative, which indeed is implied in the bankruptcy of the other two, in accounting for our experience. This is that consciousness is an attribute added to our energetic relation of conative tendency and stimulus under certain conditions — a unique gift of reality in its larger sense to some of the interactions of our finite ego. Since obeying regular laws it is no miracle; since an aspect of all our waking experience, it is no more mysterious than other unique types of reality such as space. Whether it is an abstract and ontologically separable attribute of the universe or is ever-present as an aspect of a comprehensive absolute experience does not matter for the problem in question. In either case, what is a gift to our finite experience preëxists as a character of a larger reality.

This character of awareness spans the whole field of interest, from the immediate interest of instinctive attention, where we have the "mere awareness of," to that of the most elaborate apperception of "knowledge about."

In the second place, consciousness has been confused with the species of its content. It has sometimes been treated as though it meant exclusively logical awareness, to the ruling out of non-logical types. Again it has been treated as though it signified simply motor awareness, as opposed to ideational. But the stating of such definitions is a sufficient refutation of them. The awareness itself is quite colorless. It is the psychological processes which color it; and here there is no reason why one process should be given the preëminence over the rest.

Form

I anticipate the most difficulty from the fifth attribute of which I am going to speak, viz. form or direction. We have tried so far to state the universe in terms of four attributes, those of stuff or energy, time, space, and consciousness. But none of these attributes answers the question: Does the process have direction, or is there validity in the flux? This is not accounted for by stuff, for the stuff character does not contain its own "measure." It is precisely because we recognize that the process is not what it ought to be, because our finite structures seem relative, that the question of validity is raised. The question is not answerable in terms of time, for time merely means transformation. Whether transformation towards chaos or towards unity is not answered by time. It is not statable as space, for while space conditions the realization of meaning, it does not make it valid. You cannot reduce the demand for form to mere mechanical sequence, whether psychical or physical, conscious or unconscious. There remains somehow within us the longing for order and unity, in spite of, yea, because of, the fragmentariness of our finite meaning. The merely relative fails to satisfy us.

Valid relations are a distinct type or genus from consciousness with the motley array of existences which it reveals. In the first place, our awareness may be bound up with error and illusion. That it is largely so in our experience is attested by the whole story of science. In the second place, valid relations may exist without our being conscious of them. We do not originate Euclidian geometry by becoming aware of its logical relations. While valid relations presuppose mind and also awareness at some time, we do not have to be awake all the time to keep the argument valid. And the long buried past, when once brought to consciousness, sometimes is found to be more valid than our present cogitations.

Validity implies a constitution, different from the sequential or causal, in the light of which we criticize that which happens and strive to establish clearness and distinctness in the midst of the seemingly confused relations of experience. This idealization of life, this attempt to establish the ought in what is, must be taken as a unique type of evaluation. When we insist that there ought to be truth, beauty, and goodness, in spite of the relativity of history and our individual judgments, we have at least implied a limit, a direction of history which is not relative. Else all our judgments would be equally meaningless, and there could be no degrees of worth, as in the dark all cows are gray.

The absolute idealist insists that in the absolute experience we have such a standard. This absolute experience is even now shared by us. It is this that gives rise to our consciousness of fragmentariness, which accounts for our finite sense of failure, and of which we are even now conscious as the final truth, the purpose eternally fulfilled. But the irony of history gives the lie to any such assumption. The absolute itself, as our concept, is subject to the transmutation of time. It is the expression of the finite now. Each stage of the process must create its own absolute, find its own satisfaction. The absolute, therefore, is for us at any rate merely a logical ideal. Epistemologically, it is relative. The concept of it, too, presupposes direction for such validity as it has.

That the idea of direction is valuable as a regulative idea or limit cannot be doubted. But can we also attribute ontological reality to the same? Or is it merely a hypothetical limit, the index of our ideal strivings? It seems to me, if it is required to give meaning to our relative and fragmentary purposes, that it must be at least as real as those purposes themselves. The straight line must be at least as real as the numberless variations of curvature of which it is the limit. And it is worth more, for without it there could be no such thing as measure. And so with our more general ideal demands, as contrasted with the world of existential processes.

To guarantee the validity of process or to furnish the basis for science, virtue, and beauty, the form must be selective, that is, must somehow condition the survival of structures. Only thus can it satisfy that demand for finality which the finite process at any one time fails to fulfill. This does not mean that every item is predetermined by a final cause or Idea. It need only mean that, in the changes and chances of the cosmic process, in the fluctuations and mutations of life, certain ideals of clearness and distinctness are enforced by the universe, however much beyond our comprehension such operation may be. This would accomplish in the large what our selective will as a fragment in the evolution of the universe strives to accomplish in the small.

That formal selection may condition survival we know from experience. Evaluation in terms of ideals is an important condition in social survival. Human beings are socially approved, not so much for their size, weight or strength, as for their satisfying certain ethical, æsthetic, and intellectual standards. They may, for example, be selected for their beauty rather than their strength and thus continue the race. This holds to a certain extent in animal selection as well. And in the survival of plant life and even of certain conditions of inorganic nature — the configurations of hills and valleys within our human control — form often plays the most important part in our selection. If the universe is interpenetrated and controlled in the last analysis by a master mind — the fulfillment of our ideal demands — formal value, rather than quantity of energy, may be the final basis of survival and eternity.

These attributes, while they are ultimate or irreducible kinds, differ from the parallelistic attributes of Spinoza in that they all make a difference to our creative purposes, whether they make any differences to each other or not. Hence they do not involve an epistemological contradiction. They at least overlap *as known*. They also overlap in other ways. Space makes a definite difference to interacting energies in space. Time again conditions the existence of process at all. Without it we should have a petrified world. Consciousness makes subjective realization of a world possible, while form makes it possible to understand and appreciate such a world.

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